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Observations
ON
THE PARKINSONIAN SYNDROME IN LETHARGIC ENCEPHALITIS:
A PATHOLOGICAL POSTURE.*

BY IVY MACKENZIE, M.D. GLASG.,
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The initial motor agitation bears only a superficial resemblance to that of chorea. It may vary from a series of tics affecting isolated muscles or portions of muscles of the head, trunk, or limbs, to rhythmic, undulatory, and coördinate gesticulations of the whole body resembling certain phases of hysteria. Myoclonus may be so violent as to render it difficult to prevent the self-infliction of bodily harm. Spasms of rotatory movement round the axis of the trunk may be seen either on the floor or under the bedclothes. Even where the behaviour is suggestive of chorea the phenomenon is distinct, in that by persuasion or by the attraction of attention it can be inhibited.

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CHARACTERISTIC SEQUELÆ TO LETHARGIC ENCEPHALITIS.

The sequelæ in which the nature of the disease may be disclosed for the first time are even more characteristic than its initial stages. For descriptive purposes these might be regarded as belonging to two classes according as they affect children on the one hand, and adults on the other. In considering this aspect of the problem one is naturally confined to the late effects of the earlier epidemics. In the case of children who have retained a legacy of the original disease the main disorder consists in profound emotional instability with perversion of conduct. Ebullitions of excitement, with uncontrollable impulse, manifesting itself often in outrageous and criminal conduct, would appear to afford the evidence of a serious dissolution of nervous integration effected in the earlier stages of the disease. Even in the most extravagant forms of misconduct there is rarely any clouding of the perception such as one finds in epilepsy, for when the spasm has subsided there is clear recognition of what has happened, and often an expression, even a precocious expression, of regret. After two or three years of illness one frequently finds no abatement of mental activity so far as intelligence is concerned, although, of course, organised mental development would appear in some cases to have been brought to a standstill by the incidence of the disease. The peculiar character of the sequelæ in children is probably determined by the fact that the disease has supervened during the early developmental period, and that neural dissolution has occurred before the organism has had an opportunity of establishing cerebral stability. Normal organic growth depends on the harmonious development of correlation between the basal centres which control the expressions of the grosser emotions and the cerebral centres which constitute the structural basis of perception and will-power. It is conceivable that extensive destruction of basal structures would lead to results in children quite different from those to which it would give rise in adults.

In adults in whom the early stage of lethargy was survived there was frequently a period of sleeplessness and restlessness, but there was no general tendency to the exhibition of those aberrations of conduct which lend such a distinctive colouring to the late effects in children. It has transpired, however, that some cases have acquired a relic of their own no less peculiar in its general characteristics than the impulsive restlessness of the younger victims. This relic or sequela of encephalitis in adults is described as a "Parkinsonian syndrome," on account of its alleged resemblance to paralysis agitans. A considerable literature has already appeared on the subject, and the descriptions of different observers in various countries bear testimony to the uniformity of the nature of the disability. General muscular rigidity, masking of the expression, relative immobility of the eye-balls, fixation of the head on the shoulders, restriction of movement, and especially of rotatory movement in joints, comprise in varying degrees the almost invariable features of this condition. Tremors in some cases, and especially in the hands, lend an aspect which suggests the resemblance to paralysis agitans. Propulsion or retropulsion is not present to the degree which might be expected from the facial expression and general rigidity, and the practically constant presence of inordinate salivation justifies a doubt as to its affinity to the syndrome with which it has been compared.

To those accustomed to view an illness from the point of view of the attitude, posture, or behaviour of the organism, it must have occurred that while the by-product in children is an expression of aberrant psycho-motor excitement, that in adults is closely akin to catatonia. It is, however, a catatonia without stupor, although in some cases there is a certain degree of psycho-motor retardation. This important aspect of the problem has received but very fragmentary attention in current accounts; but it cannot be dealt with here, as it is our purpose to consider a more limited but equally interesting side of the question—namely, the organic basis of the so-called "Parkinsonian syndrome."

ORGANIC BASIS OF THE PARKINSONIAN SYNDROME.

What strikes one most forcibly about a series of these cases is the extraordinary constancy of the appearance they present. The staring eyes with an expression of fear or of wonder emphasised by the immobility of countenance, the fixation of the head on the shoulders in erect posture, and the rigid attitude of the body as a whole, gliding rather than walking, are features which suggest the characters of a lay figure. In turning round the body turns as a whole. Rotation of one part of the body on another cannot take place in sufficient time to give the impression of coördinate or natural agility. A disability of this character and extent must be associated with a very widespread depression of neural function. If it depends immediately or remotely on a localised lesion, that lesion must be situated at important centres of nervous integration. The early choreiform movements and the late rigidity resembling paralysis agitans have been responsible for the suggestion that the lesion may be found in nuclei in the base of the cerebrum. Little is known, however, about the function of these nuclei in health and in

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disease, and the evidence as to their mode of action is somewhat contradictory. On the other hand, there is very definite evidence that nuclei in the mid-brain, pons, and medulla are involved in the acute processes of the early stages of encephalitis, and the clinical evidence of such involvement has been correlated with post-mortem findings. Ophthalmoplegia, facial and hypoglossal paresis, respiratory disorder, profuse salivation and trigeminal neuralgia are frequent symptoms in the initial stages, and they are symptoms whose anatomical basis can be interpreted in the light of the function of nuclei whose physiological action is generally recognised.

Although the Parkinsonian syndrome does not at first sight appear to depend on involvement of these nuclei, it does very forcibly suggest the implication of a neural system in the base of the brain to which some of them at least are closely related. This system is known as the *median longitudinal fasciculus*. According to Elliot Smith,[1] it consists of—

"a very conspicuous tract of longitudinal fibres which extends throughout the whole length of the medulla oblongata, pons, and mesencephalon, in the formatio reticularis or tegmental part of each. Below, at the level of the decussation of the pyramids it becomes continuous with the fasciculus anterior proprius of the spinal medulla, whilst, by its superior or opposite end it establishes intricate connexions in the region immediately above the mesencephalon. Throughout its whole length it lies close to the median plane and its fellow of the opposite side. In the mesencephalon it is applied to the ventral aspect of the central grey matter, whilst in the pons and medulla oblongata it is situated immediately subjacent to the grey matter of the floor of the fourth ventricle. One of its most salient features is the intimate association which it presents with the three motor nuclei from which the nerves for the supply of the muscles of the eye-balls take origin—viz., the oculo-motor nucleus, the trochlear nucleus, and the abducens nucleus. The first two of these are closely applied to its medial and dorsal aspect, while the abducens nucleus is placed on its lateral side. Into each of these nuclei it sends many collaterals, and probably also some of its constituent fibres, and these end round the nuclear cells. It would appear, therefore, that one of the most important functions of this strand is to bind together these nuclei and thus enable them to act in harmony, one with the other. Fibres also enter the median longitudinal fasciculus from the vestibular nucleus of the acoustic nerve system. The result obtained by degeneration would seem to indicate that to a large extent it is formed of fibres which run a short course within it."

The cephalic end is extremely complicated, and is believed to have relation to the globus pallidus and to nuclear centres in the posterior commissure (Muskens).[2] Into its composition there are said to enter also fibres from the cortico-bulbar tract to the oculo-motor nuclei. Whatever modification it may have undergone in its functional reaction as the result of cerebral development, it is essentially a system of great antiquity and of great neural stability. It has a phylogenetic history coincident at least with the evolution of vertebrate life. In fishes, amphibians, and reptiles it is one of the largest bundles of the medulla oblongata; and in man its fibres acquire their medullary sheaths between the sixth and seventh month of fœtal life, and at the same time as the fibres of the fasciculus anterior proprius of the spinal medulla with which it stands in connexion.

With the transference of the spinal accessory nerve from visceral to somatic innervation the median longitudinal fasciculus enters into relation with the nucleus of that nerve in its control over the muscles which regulate the movements of the head on the trunk. Here, then, is a common neural system, comprised of two long fasciculi and containing a variety of fibres, which binds in integral relationship the motor nuclei which govern the conjugate movements of the eyes and the complementary coördinate movement of the head on the trunk. It is feasible to suggest that this system is in some way associated with the phenomena of the Parkinsonian syndrome, for its activity is admittedly connected with those movements which in this disability are laid under restraint.

Posture or attitude is the dominating feature of the clinical picture. Muscular rigidity is the sign of the disease. There is no muscular wasting, no motor paralysis, and the tendon reflexes are present, and are relatively more brisk on the side which is more rigid when two sides of the body are affected in different degrees. Although there is hypertonicity, there is no spasticity. The defect is obviously one associated with muscular innervation, and yet both the upper and lower motor neurones appear themselves to be intact.

In discussing the wider combination of reflexes in the production of coördinate movement, Sherrington[3] points out that—

"the motor neurones of a muscle of the knee are the terminus ad quem of reflex arcs arising in receptors not only of its own foot, but from the crossed fore-foot and pinna, and tail also undoubtedly from the otic labyrinth, olfactory organs, and eyes. Thus, if we take as a standpoint any motor nerve to a muscle it consists of a number of motor neurones which are more or less bound into a unit mechanism; among the reflex actions of the organism a number can be brought together as a group because they all in their course converge together upon this motor mechanism, the final common path, activate it, and are in harmonious mutual relation with regard to it. They are in regard to it what were termed above 'allied' reflexes."

The problem of the functional activity of the motor neurones concerned in this syndrome should be approached in the light of this conception. The compendium of neural elements which comprise the median longitudinal fasciculus binds into a harmonious mechanism the motor nuclei to the extrinsic muscles of the eyeballs (third, fourth, and sixth), the motor nuclei for the muscles of the neck (eleventh, &c.), and through the fasciculus anterior proprius the motor nuclei in the anterior cornua of the cord. The fibres of the fasciculus may be regarded as the connector portions of reflex arcs converging on the motor nuclei whose internal arrangements constitute the motor mechanisms for the muscles they supply. Now the fasciculus itself is a tract which is common to a variety of arcs emerging from various sources, and in virtue of the peculiar properties of these sources exercises a determining influence on the activity of the motor mechanism on which they impinge. (1) Stimuli enter the fibres of the fasciculus through its complex origins from the superior colliculus, posterior commissure, and globus pallidus. (2) The influence of the cerebral cortex is exercised through the cortico-bulbar tract, some of whose fibres are said to join the fasciculus, while other oculo-motor fibres from the cortex enter the nuclei directly. These fibres are motor in the sense that they originate in the cells of the motor cortex, but they are afferent in respect of their relation to the lower motor neurones. (3) Stimuli from the visual apparatus enter the fasciculus through the midbrain, and from the fasciculus are distributed to the motor nuclei. (4) Fibres from the vestibular nucleus (Deiters') join the fasciculus to be distributed to the motor nuclei, and in addition to these other fibres find a course through the vestibulo-spinal tract to the motor nuclei in the cord.

COÖRDINATING FUNCTION OF MEDIAN LONGITUDINAL FASCICULUS.

It is thus evident that the fibres of the median longitudinal fasciculus and related structures have a very varied origin, but they have this in common that they combine in their various ways to exercise a coördinating influence, not merely on individual motor nuclei, but on a series of motor nuclei which operate in a mutually harmonious fashion for a definite purpose. The question then arises whether it is possible by examination of the contributing sources to detect any abnormality which might indicate a faulty reaction of the mechanism, of which the median longitudinal fasciculus constitutes a consolidating element. The following information is available: (1) The neural connexions of the cephalic end of the fasciculus have not been sufficiently defined to warrant their consideration in a clinical interpretation; (2) there is no evidence, in the cases examined, of disease of the motor cortex or of upper motor neurones; (3) the visual apparatus is normal;

(4) examination of the vestibular apparatus in a series of cases showed in a majority of these an abnormal reaction, and the degree of abnormality was proportionate to the gravity of the general disability.

The following record of a typical case illustrates the course of development of the disease and the present clinical state:—

CASE 1.—A single woman, aged 32, who had previously enjoyed excellent health, took ill on May 20th, 1920, with sickness and vomiting. This lasted for a week, during which she slept normally, and had no other symptoms. A pain then began at the back of the right ear, and she had a sensation in her face as if it were being squeezed. Coincident with the onset of pain, the right side of her face and right arm began to twitch; this continued for ten days, during which she was sleepless. She then passed into a delirium, which lasted other ten days. She has a vague recollection of suffering pain during the delirium. Following the delirium she had diplopia which lasted a week. During the following six months pain in the head and right arm was persistent and she never had a good night's rest, although she sometimes slept during the day. Her general condition, however, gradually improved; the pain became less, and on Dec. 12th, 1920, she resumed her work. From this time till August, 1921, she enjoyed comparatively good health, although the pain in the head and arm never completely disappeared, and she suffered occasionally from peculiar feelings in the arms and legs "as if something was working in them." In August, 1921, she noticed a stiffness in her neck, arms, and legs. This was most profound in the left arm to begin with, and it gradually became worse till she was compelled to give up work in December, 1921. Since then the stiffness has increased, more particularly on the right side, and there has been a tendency to profuse salivation. A remarkable feature in her condition is that since the onset of the rigidity the headaches have disappeared, although the pain in the shoulder and arm still remains.

Later State.—On March 19th, 1923, but for a slight tremor of the right hand, she looked, when standing in the erect position, as if she were petrified. The eye-balls were fixed, the expression was in statue-like repose, the head erect and stationary, the right shoulder slightly elevated and retracted, the arms were slightly flexed at the elbows, and the hands slightly flexed, almost meeting in front. She progresses along the floor like a mobile mass. The movement of sitting down was carried out under inhibition, and further examination shows that if the buttocks were as rigid as the shoulders, to sit would be impossible. The rigidity was more intense in the cephalic than in the caudal end of the body. The right shoulder was more rigid than the left, and the shoulder-joints were more firmly flexed than those of the elbows or hands. Rotation was defective in the joints of the limbs as well as in those of the neck. The tendon reflexes were exaggerated, and relatively more so on the side on which the rigidity was more pronounced. There was tenderness on pressure over the back of the neck and on the shoulder on the right side. There was less tenderness on pressure of the right elbow and no tenderness on pressure of the right wrist. The tongue was tremulous and was protruded with difficulty, but apart from excessive salivation the visceral systems appeared normal, and menstruation was regular. Mentally she was quite clear, and her memory was excellent. She was extremely anxious to become well, although the effort to help herself appeared to impeded by a sense of hopelessness and despair. She was emotionally unstable and wept on slight provocation. The pupils were unequal, the right being smaller and less reactive to light than the left; both pupils reacted in accommodation; there was no squint or defect of vision or of hearing. Examination of the vestibular apparatus by the caloric method and by rotation on a Bárány chair showed an absence of nystagmus, of vertigo, of falling, and of past pointing.

One is dealing here with a state of pathological posture immediately due to muscular hypertonicity. There is no paralysis except in so far as movement is restricted by abnormally increased tonus. There is obviously a disturbance of nervous equilibrium in favour of processes which induce muscular tonus.

The following summary in the first eight cases examined applies generally to the results of the examination of the vestibular reaction in a series of 32 cases. The cases are arranged in order according to the severity of the muscular rigidity. There was little difference in this respect between each of the first four, but there was more rigidity in the first four than in the last four. In Case 8 the vestibular reactions were practically normal, although the patient exhibited in a mild degree the expression and gait characteristic of the syndrome. The first four were completely incapacitated by the rigidity; the last four were able to go about and help themselves to some extent. Cases 5 and 7 are specially interesting in that while ocular movements could be induced by the caloric test and by rotation, there was no vertigo, falling, or past pointing, and the patients walked straight from the Bárány chair without reeling or stumbling. The results of the caloric tests may be summarised as follows:—

(*a*) *Nystagmus.*—(1) Absence of nystagmus to caloric test in four cases out of eight (Nos. 1, 2, 3, 4). (2) Diminished or delayed in one case (No. 5). (3) Diminished in one eye and absent in the other in one case (No. 6). (4) Normal in degree, but abnormal in direction in one eye in one case (No. 7). (5) Normal in both eyes in one case (No. 8).

(*b*) *Vertigo.*—(1) Absent in four cases (Nos. 3, 4, 5, 7). (2) Present in four cases (Nos. 1, 2, 6, 8).

(*c*) *Falling.*—Subjective and objective falling absent in those cases in which vertigo was absent (Nos. 3, 4, 5, 7).

(*d*) *Past Pointing.*—Absent in all cases except one (No. 8).

A number of interesting clinical points have been passed over in the attempt to focus attention on the involvement of the proprioceptive system, for this would appear to afford the most favourable means of interpreting the conditions of neural dissolution which underlie the syndrome. The vestibular tests, however, present a paradox which invites further inquiry. The absence of a vestibular reaction is not at first sight consistent with muscular hypertonicity. Destruction of the vestibular apparatus is followed, as a rule, by loss of muscular tone on the side of the lesion. Consideration will be devoted later to the nature of the disturbance of the proprioceptive system which is consistent with insensitiveness of the vestibular apparatus and abnormal increase in muscular tone in one and the same subject.

CLINICAL PICTURE OF LETHARGIC ENCEPHALITIS.

Attention has been called already to the fact that notwithstanding the widespread distribution of inflammatory reaction in the early stages of lethargic encephalitis, the clinical picture is one which is, generally speaking, typical for the disease. Through the maze of reactive phenomena incident to multiple foci of irritation there may be noted signs and symptoms which, when taken as a whole, are characteristic expressions of one morbid process. This, at any rate, applies to the average case which comes under the care of the hospital physician, although it is quite possible, and even probable, that there are instances in which the infection is so mild and transient as to elude recognition. It is quite otherwise, however, with the Parkinsonian syndrome, a residual legacy of the initial disorder. Here there is no evidence of those fleeting disorders which at one time take the form of motor agitation, and at another the form of paralysis, delirium, lethargy, or sleeplessness. It may be the evidence of a neuronic irritation, but it does not suggest a recrudescence of the infection in its original form; yet neither does general paralysis, although it is an expression of infective activity. As a rule it makes its first appearance at varying intervals after the curtain has been lowered on the phantasmagoria of the earlier scenes. It commences gradually; it progresses steadily; and there would seem to be a method in the manner in which one part of the body after another is brought under the restricting influence of muscular hypertonicity. In the earlier stages and in milder cases the cortical motor power would appear to be able to overcome the resistance, but in the more advanced stages the contraction increases till the patient would seem to be held in a muscular vice.

EXTENT OF INVOLVEMENT OF MECHANISM OF EQUILIBRATION.

If the results of the vestibular tests warrant the assumption that the syndrome is due to an abnormality of the mechanism of equilibration, the question naturally arises whether or to what extent that mechanism is involved in the acute inflammatory

stage of the disease. Microscopic examination of the brain in fatal cases reveals a very extensive infiltration and destruction of nervous tissue, more particularly in the basal structures. But there is no such predilection for special areas as would justify the assumption that the late effects are the direct results of local lesions. The uniformity of the clinical picture with its typical delineation from case to case suggests that the syndrome is the expression of abnormal reaction on part of some important compendium of reflexes. One is dealing not so much with the immediate results of neuronic destruction and neural dissolution as with the delayed and remote reaction of structures whose function in the harmony of nervous integration has been impaired. The syndrome supervenes after an interval of apparent recovery. It is not of the nature of a genuine recurrence, for it is not accompanied by any of the phenomena which distinguish the onset of the disease. Nevertheless a link does exist. If the absence of vestibular reaction possess the ætiological significance it would appear to indicate, then one might expect to find in the early stages of the disease some clinical evidence of disorder either of the apparatus itself or of some of the structures to which it is closely related. The vestibular tests during the acute phase show in some instances—e.g., Case 2—an exalted reaction. Giddiness, sickness, and nystagmus may be even spontaneous when the patient assumes a particular posture and disappear when that posture is changed. But these symptoms appear without any affection of hearing, and it is highly improbable that the vestibule and semi-circular canals could be the site of an inflammatory process which did not at the same time involve the cochlea. If, however, the receptor organ is not affected, the disturbance must be relegated to the important nuclei of correlation in the pons and medulla which subserve the functions of the peripheral apparatus. These nuclei are the secondary or terminal nuclei of the vestibular nerve (the primary neurones are on Scarpa's ganglion on the course of the nerve in the petrous bone). They occupy an extensive area of the rhomboid fossa (area acoustica) and extend as far forward as the caudal border of the main sensory nucleus of the trigeminal nerve, and as far backward as the rostral extremity of the nucleus gracilis. These central cellular masses of terminal neurones are described anatomically as divisible into four main nuclei: (1) Dorsal, median, or principal nucleus; (2) inferior spinal or descending nucleus; (3) superior or Bechterew's nucleus; and (4) lateral or Deiters' nucleus. Into these nuclei and into the cerebellum stimuli are poured from the reception terminals in the labyrinth. In the nuclei the stimuli are correlated and distributed according to their appropriate destinations and the functions they are supposed to perform. Fibres pass from the nuclei (1) to the motor nuclei in the brain-stem and to the anterior cornua of the cord through the vestibulo-spinal tract; (2) to the motor nuclei for the ocular muscles through the median longitudinal fasciculus; and (3) to the reticular formation of the opposite side across the median raphé. The nuclei themselves lie in close proximity to important medullary and pontine centres. On their medial aspect in front is the trigeminal nucleus, while more caudally lie the nuclei of the facial, glossopharyngeal, and vagal nerves. Their position in the brain-stem is therefore such that should they become the seat of pathological reaction, that reaction is likely to involve at the same time nervous centres which are concerned with the regulation of the vegetative systems of the organism. It is likewise reasonable to suppose that disorder of the vegetative centres, whether of an irritative, toxic, or inflammatory character, may also implicate the neighbouring nuclei of the vestibular apparatus.

There is, as a matter of fact, conclusive evidence that in the early and acute stages of lethargic encephalitis the vestibular and also the neighbouring nuclei participate in the production of the morbid phenomena. In the following case the clinical signs and symptoms could be ascribed, for the most part, to disorderly function of the vestibular nuclei.

CASE 2.—On March 21st, 1923, a married woman, aged 48, with previous good health, was seized suddenly with severe pain in back of neck and shoulders; power appeared to leave her legs; she fell to the ground and became very sick; vomiting and retching persisted for some hours, and when these symptoms ceased the pain became localised to the head and was so severe as to prevent sleep. Even pressure of head on pillow sufficed to elicit tenderness. On the following day there was twitching of muscles of face and neck. About 36 hours after onset of illness diplopia appeared, and there was an external squint on left side. Photophobia present during the first few days. There was no delirium. The temperature, 103° F. on the second day, subsided gradually in the first week. Giddiness has been a constant feature, and has been noted more particularly in certain positions. After the first few days she slept normally, and after regaining her sleep there was no pain.

Condition on Admission.—She was admitted to the Victoria Infirmary, Glasgow, on the 29th, when her only complaint was of giddiness and sickness, the symptoms appearing only when she lay on left side. Apart from an external oquint in the left eye and twitching of the eyelids, nothing abnormal was noted.

On April 3rd, quite comfortable so long as she lay on her right side; still a squint and flickering of the eyelids; no paralysis or sensory disturbance; hearing, sight, and temperature normal. No visceral disorder, but as soon as she turned on her left side she felt very giddy and imagined that objects were turning from right to left. This was associated with spontaneous nystagmus to the right. On turning on to her back or right side, giddiness and nystagmus disappeared. Cold water in the left ear, while she lay on her back, produced in seven to ten seconds nystagmus to the right. It increased in intensity after cessation of the stimulus and was accompanied by severe giddiness and sickness. Nystagmus to the left from cold water in the right ear occurred in 30 to 35 seconds.

Had this illness not occurred at a time when encephalitis was epidemic, legitimate doubt might have been cast on the diagnosis. Such doubt, however, may be regarded as dispelled by consideration of the nature of the associated phenomena. The main feature of the condition, that is to say, the giddiness, sickness, and nystagmus, might quite well have been due to a hæmorrhage into the vestibular apparatus. The sudden onset with collapse and headache might have been explained on this assumption also. But when to these expressions of disease were added the squint and diplopia, the twitching of the facial muscles, the febrile disturbance lasting for the most part of a week, and with these the absence of any affection of hearing, the conclusion was justified that the pathological process involved the vestibular nuclei in the brain-stem. This conclusion was further confirmed by the abnormally sensitive character of the vestibular reaction to the caloric and postural tests.

The following case illustrates some of the peculiar phenomena which characterise the more severe forms of the disease in children. In the course of its development the reaction passes into a phase which suggested an affinity to the Parkinsonian syndrome in adults.

CASE 3.—H. M., a well-developed and intelligent although nervous lad, aged 14, had good health till Feb. 16th, 1923, when he complained of pain in the right shoulder, radiating up the right side of the neck to the right ear. The pain was severe and persisted during the course of the day. In the evening his parents noticed intermittent twitching of the right eye-lid, and later on the right side of the face. He spent a sleepless night, and on the following day spasmodic contractions of the facial muscles were more profound and almost continuous. Irregular grimacing contortions of the face were accompanied by jerky opening of the mouth and protrusion of the tongue. At night his voice was hoarse, and he became delirious and raved about Germans and bombs, and appeared to live through incidents he had witnessed in picture-houses. On the 18th the whole of the right side was affected, and he tossed himself about in bed, assuming extraordinary attitudes. He bit and tore the bedclothes, turned his pillow time after time, and got in and out of bed. Another restless delirious night was spent partly in shouting and partly in singing pieces of songs.

Condition on Admission.—On the 19th he was admitted to the Victoria Infirmary. Both sides of the body had now become involved in the motor agitation, and he was in a state of acute delirious excitement. At one period on the

day of admission he appeared to suffer from fleeting hallucinations of different kinds. He was restrained in bed with difficulty. He wept, laughed, shouted, and sang alternately, and in his quieter moments he prayed "give me strength to kill my oppressors." For two days and two nights he remained in this excitable state; only occasionally during that period was it possible to obtain from him rational response to questions. It appeared as if the spasms of excitement occurred in phases with short intervening intervals in which he was comparatively lucid.

Course of Case.—On the 22nd he became more restful. The delirium passed off; the jerky, irregular movements continued, and he muttered in an incoherent manner, but his attention could be held with ease, and he answered simple questions intelligently and was well orientated in time and place. When his attention was held it was possible to induce cessation of the movements. An internal squint on the left side had now appeared, and he had diplopia. The temperature, 101·2° F. on admission, had gradually returned to normal. Apart from the involvement of the ocular muscle there was no evidence of paralysis, and sensation was normal. He remained perfectly quiet during the day, but at night he again became restless and delirious, although not to such an extent as on the previous nights. There was no complaint of pain since the day of the onset of illness.

On the 24th he was much quieter. The motor agitation had almost completely gone. He fed himself and was able to answer questions clearly, although somewhat slower than normal. His expression was dazed. He was inclined to be lethargic, and lay, for the most part, on his face. At night he was restless, turned the pillow about from time to time, and occasionally got out of his own bed and attempted to get into those of his neighbours. The squint and diplopia persisted, and there was spontaneous nystagmus to the right. His cerebro-spinal fluid was normal.

On March 12th he had gradually become quieter, and, although never in a deep lethargic state, slept for considerable periods during the day and night. His face had assumed a masked expression. He was cataleptic. Mentally he was quite clear, and there had been no sign of stupor or of other nervous disorders usually associated with catalepsy. His pulse, which varied from 70 to 90 per minute during the earlier stages of the disease, had varied from 50 to 60 per minute during the previous week, and on that day was registered at 40 per minute. There was no heart-block, and the circulatory system seemed to be normal in other respects. The catalepsy was associated with hypertonicity of the muscles.

On the 18th the cataleptic state persisted, and there was no mental abnormality. Patient slept well; squint still present; rapid, jerky movements of eye-balls as soon as eyes passed the middle line on either side. The periods during which these movements lasted varied from day to day and from time to time during the same day. They might last from 2 seconds to 20 seconds, and their rate appeared to be between 200 and 300 per minute. There was partial double ptosis, and the right pupil was wider than the left. Both pupils reacted to light and in accommodation; fundi normal; deep reflexes exaggerated; no sensory disturbance.

On the 30th the condition had varied but little since the 18th. The jerky movements on deviation of the eye-balls had diminished, and lasted but one or two seconds. At times there was only a slight flicker. The expression was still marked. There was a lack of ease and agility in his movements, and he was still cataleptic.

On April 5th there had been for three days no spontaneous nystagmus. The expression, however, was still masked. Patient dull, cerebration slow although quite clear; squint present. Cataleptic posture not so well sustained; definite catatonic resistance and rigidity in left lower limb; deep reflexes were exaggerated. So long as spontaneous nystagmus was present it was considered inadvisable to make vestibular tests. These tests now failed to reveal nystagmus by the caloric method.

Whatever may be the ultimate outcome in this particular case, there can be no doubt that already in the early weeks of the disease it exhibited not only an involvement of the structures related to the vestibular apparatus, but also a state of abnormal tonus akin to that which characterises the Parkinsonian syndrome.

While these two cases are selected from a series of 15 in order to demonstrate the occurrence of vestibular phenomena in the incipient phase of the disease, a review of the prominent signs and symptoms in the whole series indicates that these phenomena are by no means unusual. Thus, diplopia or squint was present in 14, spontaneous nystagmus in four, giddiness in five, revolving on the longitudinal axis of the body in three, and incoördinate motor agitation (including choreiform movements (six), twitchings (seven), and coarse general tremors (two)) in 15. Signs and symptoms referable to the nuclear centres in close proximity to the vestibular nucleus were noted as follows: Trigeminal neuralgia in six, vomiting in six, rapid respiration in five, slow pulse in two, rapid pulse in three, pain in neck and shoulder in five. There has been no opportunity to correlate the earlier with the later clinical features of the Parkinsonian cases, and attention has been directed to the vestibular phenomena in the recent epidemic in view of the fact that the labyrinthine tests in the sequelæ were a subject of observation at the time of the outbreak.

PATHOGENY OF THE PARKINSONIAN SYNDROME.

Two leading questions suggest themselves in considering the pathogenesis of a syndrome of this kind; these have reference to (1) the site and the character of the structural changes underlying the reaction; and (2) the nature of the perverted physiological processes responsible for the uniformity of the clinical picture.

(1) To the first question no satisfactory answer has been offered. This is not surprising when one considers the great variety of structural changes which have been described in paralysis agitans. In this condition regressive changes have been described in the corpora striata, thalami, substantia nigra, pons, and medulla. These admittedly are sites in which the lesions in acute encephalitis are found. But pathological degeneration of the same structures in other diseases does not give rise to clinical states which have a resemblance to the Parkinsonian syndrome. An instructive analogy may be found in general paralysis of the insane, a disease due to the particular manner in which a specific virus attacks the nervous system. Here also the uniformity of the clinical delineation from case to case is associated, not with any localised lesion, but with neuronic and vascular degeneration in the tissues of both the forebrain and brain stem. We have examined a number of brains from acute and from chronic stages of encephalitis, and the lesions have been so diffuse and so widespread as to preclude the possibility of formulating a specific correlation between the anatomical abnormality and the clinical disorder of function. Infiltration and degeneration of the vestibular nuclei (although accompanied by lesions elsewhere) have nevertheless been observed in several instances.

(2) It is no reflection on the value of histological investigation to suggest that the attempt to find an anatomical basis for clinical phenomena is often responsible for hasty and ill-considered conclusions. It is only on some occasions that it is possible to bridge the gulf between degenerate tissue and abnormal organic reaction by a process of satisfactory reasoning. In such well-recognised conditions as chronic heart disease, chronic nephritis, or general paralysis of the insane, the pathologist and the clinician are able to recognise the abnormal process each from his own point of view; there may be complete agreement between the two as to the concurrence and interdependence of the anatomical and clinical states, but the nature of the association between the states is usually a matter of conjecture.

In the Parkinsonian syndrome, the outstanding features of organic behaviour are the attitude of the patient, the muscular rigidity, and the impediment of voluntary movement especially of a rotatory character. In the absence of evidence of involvement of the cortico-spinal tracts attention is attracted to the complementary proprioceptive system. Examination of the vestibular apparatus shows that in a proportion of cases there is evidence of interference with the normal processes of somatic equilibration. The extent of abnormal reaction to the caloric and rotation tests seems to bear some relation to the degree of rigidity.

The significance of the vestibular tests may be estimated in the light of the principle of "associated phenomena" expounded by Mackenzie in his inter-

pretation of the signs and symptoms of disease. The associated clinical phenomena in this problem may be divided into (*a*) those which are directly related to the system of equilibration, and (*b*) those which are related to nervous structures which lie in immediate proximity to the vestibular nuclei in the pons and medulla.

(*a*) There can be no doubt that in the acute phase of many cases of encephalitis the nervous structures which subserve equilibration are affected. Diplopia, squint, nystagmus, giddiness, rotatory movement, catalepsy without stupor, are all evidence of this. The absence of any affection of hearing precludes the likelihood of involvement of the internal ear, and the signs and symptoms are not such as are usual in disease of cerebellar origin. There is thus justification for supposing that the disorder is expressive of abnormal reaction on the part of the proprioceptive system which is represented in the vestibular nuclei of the medulla and pons.

(*b*) The associated clinical phenomena which have no reference to equilibration confirm this suspicion. The intensive trigeminal neuralgia, sometimes in the eye or in the ear or in the teeth, which marks the onset of the disease is probably due to affection of the trigeminal nuclei which lies in close relation to the vestibular nuclei. Respiratory disorder and vomiting may be referred to abnormal reaction of a compendium of medullary reflexes which is also in close relation to the vestibular nuclei. Excessive salivation, which is one of the most constant and most prominent signs of the Parkinsonian syndrome, must be associated with irritation of the salivary nucleus which lies also in close proximity to the vestibular nuclei. The tremor of the tongue, the defect in mastication and swallowing, and the lack of expression in phonation, are probably a local expression of the general motor disability, although they are so pronounced in some cases as to suggest a special implication of the pons and medulla.

If there is any justification for regarding the vestibular nuclei and their associated reflex arcs as a mediating centre in the production of the Parkinsonian syndrome, the question arises as to the manner in which they participate. The vestibular nuclei comprise the secondary or terminal neurones of the vestibular apparatus. They bear the same relation to the vestibular portion of the internal ear as do the trigeminal nuclei to the skin and mucous membranes supplied by the fifth nerves. They are the centres of correlation for stimuli induced in the internal ear through movements of the body in space, just as the trigeminal nuclei are centres of correlation for stimuli of exteroceptive origin impinging on its area of distribution. The fifth nerve has to do with the conduction of stimuli for touch, pain, heat, and cold, while the vestibular nerve is concerned exclusively with the conduction of stimuli which induce a state of muscular tonus indispensable to the maintenance of somatic equilibrium. Under physiological conditions the trigeminal nucleus is stimulated from the mucous and cutaneous surfaces of the head; but it may be, and usually is in pathological states, subjected to irritation of central origin. For example, the headaches of fever, migraine, epilepsy, neurasthenia, and biliary colic are associated with either toxic or excessive irritation of the trigeminal compendium, and the site of stimulation is not the periphery but the central or terminal nuclei in the medulla and pons. There is no necessity to labour this point in demonstration of which a great mass of clinical evidence could be adduced. There is reason to believe that the vestibular nuclei may also become "foci of irritation" (Mackenzie) or sites of abnormal reaction from stimuli which impinge on them, not from the vestibular apparatus but from sources of central origin. The frequent occurrence of headache and vomiting with giddiness is indicative of the proclivity of medullary centres to become the seat of aberrant irradiation of neural stimuli in whose clinical manifestations reaction of the vestibular nuclei plays an important part. Giddiness is only one of the by-products of abnormal vestibular recoil; it is the resonance in consciousness of the irregular behaviour of vestibular structures which in the normal course of events make no appeal to the higher centres of the brain. The vestibular nuclei are the main centres of correlation of the afferent stimuli of the proprioceptive system; in this capacity they are in close functional relationship with the internal ear, the eyes, the cerebrum, the red nucleus, and the cerebellum. Hughlings Jackson and Sherrington have laid the clinical and experimental foundation of observations which show that this system contributes to the coördination of somatic movement by the influence it exercises on muscular tone. In the posture of post-hemiplegic and decerebrate rigidity it plays its rôle by the production of abnormal muscular tonus. It is suggested here that abnormal irritation of the vestibular nuclei and their associated structures is responsible for the pathological features of the Parkinsonian syndrome. This conception, while it explains the rigidity, accounts also for the increased salivation and for the absence and abnormality of vestibular reactions in the more advanced stages, in which stimuli from the ear cannot be correlated in nuclei which are already in a state of pathological activity. There is probably a close analogy between the persistent headaches which follow influenza and the rigidity which is so prominent a sequela of infective encephalitis.

I am much indebted to my colleague Dr. Hector M. Walker for his assistance in this research.

[Since this article was written an important communication on "Lethargic Encephalitis and Herpes Febrilis" has appeared, in *Brain*, by Syzmanowski and Zylberlast-Zand.[4] They find that "in animals (rabbits infected with emulsion from cases of lethargic encephalitis) the most common symptoms are abnormal position of the head, circus movements, nystagmus, and oscillating movements of the head, that is, symptoms of labyrinthine involvement." In their microscopic findings they note that "the rabbit No. 31 helped to determine the origin of the labyrinthine symptoms," so often met in their investigations. They say that "no inflammatory changes were discovered in the brain tissue except in the nucleus of the nervus vestibularis and in the tuberculum acusticum. The cells of the vestibular nucleus were degenerated. Slight changes were also found in the cells of Deiters's nuclei and in the nuclei of the floor of the fourth ventricle, but the cells of the cerebellum, red nuclei, and nuclei dentate were not affected."]

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AN IMMUNITY REACTION IN SCARLET FEVER.*

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IN 1918 Schultz and Charlton[1] described the following phenomenon in connexion with scarlet fever (I give a free translation of their words): "If one injects intracutaneously into the skin of a scarlet fever patient with a bright rash 1 c.cm. of serum from a normal person, or from a convalescent case of scarlet fever, there appears, after a time, at the site of the injection, a characteristic change. This begins after about six hours, and consists in a complete blanching of the rash over an area of from half an inch to a few inches in diameter. The area of pallor is usually circular or oval in shape, the margin being as

* A paper read to the Fever Hospital Medical Service Group of the Society of Medical Officers of Health, Nov. 23rd, 1923.

a rule only slightly irregular. In the affected area the swollen follicles, which are a feature of many rashes, disappear. Looked at from a little distance, the margin of the defect in the rash is generally pretty sharply defined. In one case we saw the contrast between the pale area and the surrounding rash heightened by a markedly hyperæmic margin. The colour of the blanched area is that of the normal skin. The duration of the phenomenon coincides, on the whole, with that of the rash itself; at any rate, it may remain quite visible for several days."

Schultz and Charlton found that this reaction could be obtained in the great majority of scarlet fever cases with a sufficiently well developed rash. For a series of 46 cases they report 40 positive reactions, five being doubtful and one negative; but they state, without giving particulars, that they have since obtained a higher percentage of negative results. They do not mention the source of the serum used in the tests, but merely say that they could detect no qualitative difference between the action of convalescent scarlet fever serum and that from normal persons. On the other hand, the serum from scarlet fever patients during the acute stage of the illness invariably gave negative results. They tested the serum of a number of scarlet fever cases taken at different stages of the disease and give the results shown in Table I. Apparently all the sera were from different individuals.

TABLE I.

Day of disease.	No. of cases tested.	Result.	Day of disease.	No. of cases tested.	Result.
1st	2	0	16th	1	0
				1	+
2nd	1	0	17th	1	0
3rd	3	0		2	+
4th–13th	14	0	18th	1	0
				2	+
14th	2	0	19th	2	+
	1	+			
15th	2	0	20th	1	+
	1	+	21st	3	+

They conclude that the serum of the scarlet fever convalescent "recovers its lost power of blanching the rash between the fourteenth and nineteenth days of the disease." Thus Schultz and Charlton assume that their reaction is due to a normal property of human serum which is temporarily lost during the acute stage of scarlet fever, to be regained during convalescence. I shall show later that this is an unwarranted assumption. In the meantime, it may be noted that according to their own observations we should have to suppose that this mysterious property of normal serum disappears suddenly with the onset of scarlet fever. It is absent even on the first day of illness.

Implied Serological Means of Diagnosis.

Although Schultz and Charlton are in general very restrained and cautious in their attitude, and do not even suggest any practical application of their reaction in diagnosis, their unfortunate assumption as to its nature is, I think, partly responsible for a fallacy which has appeared in the work of their immediate followers. If their assumption were true, then obviously we should have a serological means of diagnosing cases of scarlet fever; a serum which does not give the reaction must be that of a patient in the acute stage of the disease.

This position has been adopted uncritically by Paschen,[2] Neumann,[3] and others. Although Paschen had the opportunity of testing the serum of a child five days before she developed scarlet fever, and found it negative, this did not shake his faith in the dogma. It was for him merely a puzzling exception to the rule. Paschen tested 71 scarlet fever rashes and found the reaction positive in 62; the source of the sera used is not mentioned. Neumann tested the sera of 23 scarlet fever convalescents and obtained positive reactions in all but three; he attributed the failure in these three cases to the fact that the rashes faded too soon. He noted that a serum which gave a positive reaction in one rash might fail to do so in another. Thus four sera tested on different rashes gave:—

Sera	+	0	Sera	+	0
2	3	1	1	1	1
1	2	1			

He tested the sera of 59 cases of scarlet fever within the first four days of the disease and found that of these only three gave the reaction. The sera of three children with rubella gave a negative reaction, and Neumann also regards these as being "remarkable exceptions" to the rule. In spite of these findings, Neumann formulates explicitly the rule for the diagnosis of doubtful cases of scarlet fever on this basis. If the serum gives a positive Schultz-Charlton reaction it is *not* from a scarlet fever case (presumably in the first fortnight of the disease); if the serum does not give the reaction it *is* from a case of scarlet fever.

Mulsow[4] tested the serum of acute cases of scarlet fever, convalescents and normal persons, giving the results separately. Omitting two cases where the reaction was doubtful, he found the sera from eight scarlet fever cases in the acute stage negative, the sera of six scarlet fever convalescents positive, and among the sera of seven normal persons one negative. His observations also show that a serum which gives a positive reaction with one rash may give a negative reaction with another. Mulsow rightly concludes that a negative reaction can give no help in the diagnosis of scarlet fever in the patient from whom the serum was obtained.

The observations of Tron[5] are much at variance with those of all others who have worked at the subject. It is possible that his standard of what constitutes a positive reaction is higher than usual. In 47 scarlet fever convalescents after the third week he obtained only 10 positive results; 15 cases of scarlet fever in the acute stage were negative; among 16 cases of follicular tonsillitis and laryngeal catarrh he found two positive, and among 12 cases of diphtheria four positive.

As regards the specificity of the test for the scarlet fever rash Table II. shows the number and nature of other rashes which have been tested by the intracutaneous injection of serum, all with negative results.

TABLE II.

Authors.	Measles.	Influenza.	Paratyphoid	Erythema.	Serum rashes.	Drug rashes.
Schultz and Charlton ..	11	—	—	2	—	2
Paschen	1	2	2	3	1	3
Neumann ..	3	—	1	1	3	4
Total ..	15	2	3	6	4	9

Inquiry into Nature of Schultz-Charlton Reaction.

About a year ago Dr. E. W. Goodall drew my attention to the Schultz-Charlton reaction, and with his help, and that of Drs. F. H. Thomson and C. E. Matthews, I have been making some inquiries into its nature. I am also particularly indebted to Dr. J. W. Mann, of the North-Eastern Fever Hospital, for his assistance in carrying out some of the tests.

There is no doubt that the reaction, when well marked, is a very striking phenomenon. As regards its appearance, there is little to add to the description given by its discoverers. One point of interest should, however, be noted. Where there is early and profuse desquamation the blanched area may remain visible for a week or more, being clearly marked off from the surrounding skin by the absence of desquamation. Schultz,[6] in a later paper, also notes this condition and emphasises the fact that the blanched area is an area of normal skin, as shown by the absence of exudative phenomena (sudamina and swollen papillæ) when these occur, as well as by the disappearance of the rash. In these well-marked reactions one cannot resist the impression that the injection of the serum

has completely suppressed the whole sequence of pathological events which are occurring in the skin elsewhere. But these striking reactions are somewhat uncommon; the area of pallor does not always persist till the rest of the rash has disappeared; sometimes the rash reappears after an interval, and often it never completely disappears from the area affected. In the latter case it may be difficult to decide whether or not there has been any reaction. With regard to the time at which the reaction first appears, there is considerable variation. I have not seen it as early as the six hours mentioned by Schultz and Charlton, and it is certainly sometimes better marked after 24 hours than earlier.

A Toxin-Antitoxin Phenomenon.

From the beginning I have thought it likely that in the Schultz-Charlton reaction we have to deal with a toxin-antitoxin phenomenon; and the justification of the title chosen for this paper is that, after a study of the literature and consideration of our own results, I still think that this is the most probable explanation of the facts. I have shown elsewhere [7] that there is reason to believe that in scarlet fever there is concerned a toxin which presents certain points of resemblance to that of diphtheria. We have to suppose that the rash and other changes in the skin are due to a scarlatinal toxin which has entered into combination with the tissue cells; among the affected cells are those contractile elements which have been shown to exist even in capillary blood-vessels [8] and to the function of which the normal tone of the capillaries is due. The toxin interferes with the function of these cells and a loss of tone of the capillaries results in the erythema and exudative phenomena with which we are familiar in the scarlatinal rash. The serum injected, when it gives a positive reaction, we suppose to contain an antitoxin which is able to dislodge and neutralise the toxin fixed in the cells, and so to restore their normal function in the area affected. The period of delay, 12 to 24 hours, in the appearance of the reaction, is no doubt due to the fact that the toxin is attached to the cells, and some time is thus required for its neutralisation. When the rash fades in a normal manner the mechanism is probably different as this occurs long before any antitoxin can be demonstrated in the patient's blood.

Now diphtheria is a disease which in many other respects exhibits analogies and even relationships with scarlet fever. It is known that over 80 per cent. of so-called normal adults have appreciable amounts of diphtheria antitoxin in their blood, but we do not therefore assume that the diphtheria patient has antitoxin in his blood before he is attacked, and that he suddenly loses this antitoxin on the first day of the disease. It is, of course, known that the diphtheria patient has no antitoxin, or only inappreciable traces, in his blood before he is attacked by the disease, and the same is no doubt true of scarlet fever. The reason for the negative Schultz-Charlton reaction given by the serum of scarlet fever patients in the first fortnight of their illness is simply that the necessary antitoxin has not yet had time to develop. It follows that when the serum of a so-called normal person is found to give the reaction, this means, just as in the case of diphtheria, that the individual in question has acquired at least a certain degree of immunity to scarlet fever, either by an attack of the disease, or by an atypical illness which could not be diagnosed as such, or possibly by a series of subinfective immunising doses, or by a combination of these events.

In diphtheria we have to deal with a known toxin and antitoxin which can both be accurately measured, and the Schick test gives an easy means of estimating, at least approximately, the amount of antitoxin in the blood of any individual. In scarlet fever, we are dependent, as yet, on casual occurrences in nature for our test toxin. This, fortunately, manifests itself in the scarlet fever rash in a form which is not altogether unsuitable for the demonstration of antitoxin, but which leaves much to be desired from a quantitative standpoint. We are dealing with two unknown variables, the amount of toxin to be neutralised, and the amount of antitoxin available for its neutralisation.

Differing Reactions of Same Serum in Individual Cases.

Let us now see how this hypothesis, founded on what is known in regard to an analogous disease, agrees with the facts. It was desired in the first place to ascertain how the same sample of serum reacts when tested on different scarlet fever rashes; 5 c.cm. of blood were taken from each of 14 scarlet fever convalescents in the fifth week or later. The sera after separation were pooled and distributed in ampoules in amounts of about 1 c.cm. This pooled serum was tested on 18 different rashes; 14 of these gave a positive, 1 gave a negative reaction, and in 3 no reading was possible owing to the whole rash having disappeared. The one case where no reaction was obtained was a very severe case with persistent rash which became brighter on the fourth day. The test was made on the fifth day of the rash. On the sixth day the patient was still delirious and the rash bright, but she made a good recovery without complications. In this case there was probably more toxin present than could be neutralised by the serum injected. Other observers have noted that in a case which subsequently proved fatal the rash was not blanched by the injection of serum (Wöhlisch and Mikulicz-Radecki [9]).

The serum from a normal adult, with a history of scarlet fever in childhood, was tested on eight cases; in seven it gave a positive reaction and in one a negative. The case which gave the negative reaction had a coarsely punctate rash with little or no diffuse erythema. This type of rash does not appear to be suitable for the test. With both these sera it was noted that the degree of the reaction varied much from case to case, although the same amount of serum was injected.

Twelve samples of serum from scarlet fever convalescents were now tested separately on a number of different scarlet fever rashes with the results shown in Table III.

TABLE III.

Sera.	+ Cases	0	Sera.	+ Cases	0
1	2	0	7	2	0
2	4	0	8	4	0
3	2	2	9	1	1
4	4	0	10	4	0
5	4	0	11	2	0
6	3	1	12	3	0

Again, it was noted that the reaction of a given serum varied considerably in degree according to the rash on which it was tested. It follows from these observations that in testing any serum a single distinct positive result is of value and can be accepted as indicating that the serum in question contains antitoxin whereas a serum can be shown to be negative only if it has been tested on a number of rashes, or better, if it has been tested on a case which has at the same time given a clear positive reaction with another serum. We can compare one serum with another, by testing both on the same rash, but owing to the variability of the test object we cannot, strictly speaking, do more than this in the direction of a quantitative estimation.

In order to find at what period of convalescence the reaction develops in the serum of the scarlet fever patient, some observations were made with the serum of the same patients taken at different times. As a rule, the sera taken on different days from the same case were tested on the same rash and could thus be compared quantitatively. The results are shown in Table IV.

Thus the time at which the reaction appears varies in different patients. It is not always found as early as the twenty-first day, and there is evidence of

an increase in the degree of the reaction during the fourth week. The sera of three other cases in the first week gave negative reactions. Seven other scarlet fever convalescents were examined during the fifth week or later, and all their sera gave positive reactions. The sera of all the 25 convalescent cases examined were therefore positive.

TABLE IV.

Case.	Negative.	Positive.	Case.	Slight.	Well-marked.
1	3rd day	15th day	5	15th day	25th day
2	3rd ,,	18th ,,	6	20th ,,	29th ,,
3	7th ,,	17th ,,			
4	21st ,,	38th ,,			

Now, if our hypothesis be true, it should be possible to find individuals whose serum does not give the reaction, although they are not at the time suffering from scarlet fever either in the acute stage or in the early weeks of convalescence. At an early period I was able to satisfy myself that the serum of a healthy boy, aged 10, was quite without the property in question. This serum was tested on four rashes with negative results, two of which at the same time gave positive reactions with another serum.

A Question of Immunity.

Later, by a fortunate chance, I was able to test the serum of a girl, aged 5, a convalescent diphtheria case, who was attacked by scarlet fever four days after the sample of blood was taken. This serum gave a negative reaction. Another sample was taken on the thirty-eighth day from the onset of scarlet fever, and her serum now gave a positive reaction. This amounts to a demonstration that the property of the serum which gives rise to the Schultz-Charlton phenomenon is one which can be acquired as the result of an attack of scarlet fever; and this fact alone would appear to make it extremely probable that we are dealing with a question of immunity. It is, in fact, quite easy to find children of the ages at which scarlet fever is common whose sera give negative reactions. Not including the two negative cases already mentioned, I have found, among 13 children, seven whose sera were negative. One of these was in the acute stage of measles, one was a measles convalescent, and the remaining five were diphtheria convalescents. Of the six cases whose sera were positive, four were diphtheria convalescents, and two were cases of erythema, where the positive Schultz-Charlton reaction was of value in confirming the negative diagnosis as regards scarlet fever. In none of the children was there any history of scarlet fever.

In this connexion it appeared that it would be of interest to examine the blood of newly-born infants. Through the kindness of Miss Mocatto I was able to obtain from Queen Charlotte's Hospital four samples of blood from the umbilical cord, with corresponding samples of the maternal blood. These were tested in pairs on the same rashes with very interesting results. In each case the serum of the new-born child gave an exactly similar reaction to that of its mother. In two of the cases distinct positive reactions were observed. In one of these the mother gave a history of previous scarlet fever. The other two gave such feeble and indefinite reactions that it was doubtful whether they should not be classed as negative. The scarlatinal antitoxin, therefore, behaves like that of diphtheria, in passing through the placenta from mother to child, in such a way that the titre of the two sera is identical.

With regard to adults, it seems probable that the proportion of positively reacting sera is high; I have few personal observations, but if it were not so it would be difficult to understand the attitude of previous writers on the subject, who have not thought it worth while to distinguish between the serum of "normal persons" and that of scarlet fever convalescents in giving their results. Omitting the maternity cases already referred to, I have examined the sera from nine adults with eight positive results and one negative.

In three of the positive cases there was a history of scarlet fever many years before; five of the cases were nurses in scarlet fever wards with no history of scarlet fever; one of these gave a negative reaction; the other four gave very well-marked positive reactions. The occurrence of these marked reactions in nurses exposed to frequent and close contact with scarlet fever patients certainly suggests the possibility of immunisation without a definite attack of the disease. The remaining case was one of enteric with a rash which was probably the result of enemata; here again the positive reaction was of assistance in excluding the diagnosis of scarlet fever.

Technique of the Reaction.

A few points in the technique of the reaction may now be noted. A positively reacting serum may be heated for half an hour at 55° C. without impairing its power. It may also be stored for long periods in the cold room without alteration. I have obtained positive reactions with sera kept thus for nine months. As regards the quantity of serum to be injected, this should be at least half a cubic centimetre, although some sera give the reaction in smaller amounts. In the observations described above the amount of serum used was from 0·7 c.cm. to 1 c.cm. This seems a large amount to be injected intracutaneously, but experience has shown that after the prick of the needle and the injection of the first few tenths of a cubic centimetre, the remainder of the injection causes the patient no discomfort.

It is hardly to be expected that a complete demonstration of the nature of the interesting phenomenon to which I have called your attention can be obtained until we know something more of the cause of scarlet fever. In the meantime, the evidence in favour of the toxin-antitoxin hypothesis is, I think, sufficient to justify us in undertaking a more extensive investigation of the phenomenon from this point of view. Such an investigation would, no doubt, throw light on the epidemiology of scarlet fever, just as the Schick test has done in the case of diphtheria. In another way, also I think, the reaction is likely to help in the elucidation of the ætiology of scarlet fever. Claims are put forward from time to time that a particular organism, isolated from the throat or elsewhere, is the cause of scarlet fever. The fact that no experimental animal can be found which is susceptible to scarlet fever, in the sense of showing all the symptoms of the human disease, has proved a barrier to the proof or disproof of these claims. If, however, our hypothesis is correct, it seems highly probable that the true causal micro-organism will be capable of producing a toxin, and, by the immunisation of animals, an antitoxin, of which the latter should give the Schultz-Charlton reaction in man.

It would be well to maintain an attitude of reserve towards the claims put forward for any particular micro-organism until it has been shown to be capable of producing such an antitoxin.

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ON IMMUNO-TRANSFUSION.

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(*Concluded from p. 1334.*)

Procedure Employed for Drawing Blood from the Donor and Defibrinating It.

Apparatus Required.—This is shown in Fig. 1.‡ A needle, about two feet of rubber tubing, and a short piece of glass tubing, serve to conduct the blood from the donor's vein to the bottle. The latter is of about one litre capacity, and is fitted with a rubber bung. Through the centre of the bung is passed a glass rod, bent at its lower end in the form of a U, which is intended to collect the fibrin clot during defibrination of the blood. The escape of air from the bottle as the blood runs into it is provided for by a third hole through the bung. This is lightly plugged with cotton-wool (A). Attention may be called to three points of detail: (1) The bore of the needle should be not less than 1½ mm.—with this size it is usual to draw off 500 c.cm. of blood in four to six minutes. A smaller needle might become partially blocked with clot before the bleeding was completed. (2) The glass tube admitting the blood to the bottle should not extend more than an inch or two below the bung. In this position we can easily observe the rate of flow from its orifice. (3) When the bottle and its connexions are kept sterilised for use in an emergency, the needle should be detached and sterilised independently—otherwise it will rust.

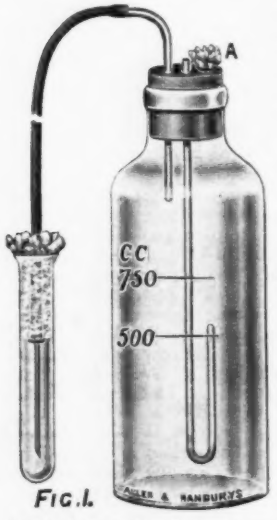


FIG. I.

Apparatus employed for drawing blood from the donor and defibrinating it.

Technique of the Bleeding Operation.—Our practice has followed closely the description given by Fleming and Porteous (THE LANCET, 1919, i., 973) to which the reader is referred. It has never been found necessary to incise the skin and expose the vein of a donor. Two points only seem to us to require emphasis—viz., the importance of obtaining at the outet the proper degree of venous congestion by the tourniquet, and of maintaining this, so long as the blood is flowing, by the donor's muscular efforts. He should be instructed to close the fist tightly and relax again five or six times a minute. This simple but effective trick is often forgotten.

Defibrination of the Blood.

Our aim is to obtain the blood in a permanently fluid form with nearly its normal content of corpuscles—in particular, of white corpuscles. In other words, we must so arrange things that the great bulk of the corpuscles are not caught up in the fibrin meshwork at the moment of clotting. To secure this result we keep the blood continuously in motion around a rigid scaffolding on which the fibrin filaments as they form become very rapidly entangled. The scaffolding is provided in our apparatus by the glass U. Our procedure is as follows: Commencing not later than one and a half minutes after the blood first begins to flow into the bottle, we move the latter without ceasing in a rotatory fashion and fairly briskly until at least six minutes after the needle is withdrawn from the vein. As stated above the time usually taken to collect 500 c.cm. of blood is 4 to 6 minutes. Shaking of the bottle has, therefore, to be kept up for 10 to 12 minutes. The fibrin clot in blood treated in this way is found tightly adherent to the glass U. Its volume is about 10 to 20 c.cm. for 500 c.cm. of blood. The fluid blood retains practically all its red corpuscles, and 70 to 75 per cent. of its leucocytes.

On the Question of Keeping the Donor's Blood for Some Hours Before Injection.

This question is of some practical importance. The results already obtained allow one to hope that immuno-transfusion will prove of value in the treatment of fulminating septicæmic conditions such as acute puerperal fever, osteomyelitis, &c. If this expectation is justified it is important that the method should be made available at short notice for patients in the country as well as in the cities. This will be possible if it can be shown that the quality of the blood does not undergo appreciable deterioration within three or four hours of its being withdrawn from the donor. At a summons by telegram or telephone a donor could be chosen from a register kept in cities and large towns, immunisation and bleeding could be carried out by someone familiar with these procedures, and the blood could be transported without delay to the patient's bedside perhaps many miles away.

The following experiments bear upon this matter. They were undertaken to show whether the bactericidal efficiency of the blood—for it is with this property that we are chiefly concerned in carrying out an immuno-transfusion—becomes diminished on keeping it, and also whether such diminution is dependent upon the temperature at which the blood is kept. A normal individual was inoculated subcutaneously with staphylococcus vaccine. Specimens of blood were taken before the inoculation and four hours after, and each was defibrinated. The specimen taken four hours after inoculation was divided into two parts, one being incubated at 37° C., the other kept at room temperature. Tests of the hæmo-bactericidal efficiency were carried out (by the method of "slide cells," as in experiments 1 to 7) with the bloods taken before and after inoculation, and also with the latter sample after it had been kept for stated periods at the different temperatures. The results were as shown in Table IV.

TABLE IV.

Blood of—	Number of colonies which grew in :—	No. of Staph. implanted in the blood (as determined by an agar count) : *(882) (294) 98		
L. C., inoc. with 500 mill. Staph.	Blood taken before inoculation	47	18	5
	Blood taken 4 hr. after inoculation and tested immediately	11	9	2
	Same blood tested after standing :			
	1 hr. at room temperature ..	27	11	5
	1 hr. at 37° C.	40	10	5
	4 hr. at room temperature ..	34	13	4
	4 hr. at 37° C.	29	12	7
E. J. S., inoc. with 750 mill. Staph.	Blood taken before inoculation ..	92	27	11
	Blood taken 4 hr. after inoculation and tested immediately	25	5	4
	Same blood tested after standing :			
	1 hr. at room temperature ..	20	5	1
	1 hr. at 37° C.	14	2	2
	4 hr. at room temperature ..	49	16	4
	4 hr. at 37° C.	26	13	2

* The figures given in brackets represent calculated, not actual, counts.

As these two results did not give very clear indications a third experiment was carried out by Dr. H. B.

‡ Messrs. Allen and Hanburys are prepared to supply the complete apparatus.

Maitland. The plan of this experiment differed slightly from the foregoing in that, at each testing, the blood was implanted in bulk with living Staphylococci, and *several* 50 c.mm. samples were transferred to slide cells for incubation. Experimental errors were in this way minimised. The result obtained was as shown in Table V.:—

TABLE V.—*Blood of E. J. S., Inoculated with 1000 Million Staphylococci.*

—	No. of Staph. implanted in blood (as determined by agar counts).	No. of colonies which grew in the blood.	Percentage of Staph. which survived in blood.
Blood taken before inoc...	198	28, 44, 37, 44 } aver. 44, 53, 46, 60 } 44	22
Blood taken 4 hr. after inoc. and tested immediately	177	19, 12, 6, 3, } aver. 7, 9, 5, 10 } 9	5
Same blood tested after standing: 1 hr. at room temp.	155	3, 6, 10, 10, } aver. 7, 5, 16, 16 } 9	6
1 hr. at 37° C. ..	142	6, 8, 6, 12, } aver. 15, 8, 13, 7 } 9	6·6
4 hr. at room temp.	745*	17, 13, 12, 16, } aver. 30, 36, 42, 27 } 24	3·2
4 hr. at 37° C. ..	686*	36, 49, 44, 29, } aver. 38, 36, 34, 29 } 37	5·4

* A different staphylococcal emulsion was here employed.

The results set out in the last column of the table show—and this experiment carries more weight than the other two by reason of the multiple sampling adopted at each test—that an "immune" blood loses little, if any, of its bactericidal efficiency on being kept for periods up to four hours, either at room temperature or at 37° C.

We conclude, then, that it is permissible, if circumstances require it, to allow a period of several hours to elapse between the bleeding of the donor and the transfusion of the patient, and that it is not necessary to keep the blood warm during the interval.

With regard to this last point it will, perhaps, be urged that, quite apart from any question of deterioration of the quality of the blood, it is manifestly desirable that this should be warm when it is injected into the patient. We would suggest that this consideration is probably of very little importance. The stream of blood which we inject into the patient is so small in relation to the very large volume of venous blood with which it is almost immediately mixed in the great veins and the auricles, that it can have only an extremely small effect in reducing the temperature of the whole circulating blood.

Procedure for Injecting the Blood into the Patient.

To drive the blood out of the bottle into the patient's vein a positive pressure is required. This may be obtained (*a*) by gravity, using the "funnel-and-tube method" for the injection; (*b*) by means of an air pump of the Higginson type, as recommended by Robertson,[8] Fleming and Porteous,[9] and others; (*c*) by means of a syringe acting as a combined suction and force pump, as recommended in 1911 by Fleming and Colebrook[10] for the injection of "606."

We have never employed the first method. It serves well enough, no doubt, if one exposes the patient's vein and ties in a cannula, but it may lead to difficulties when one dispenses with that unnecessary procedure and simply injects the blood through a needle. The patient's veins, when immuno-transfusion is required, are often partially collapsed, and one cannot always be sure of plunging the needle directly into the lumen, or of keeping it in that position throughout the operation. In these circumstances it is of the utmost importance that the pressure system should enable us at the commencement of the operation, or at any moment subsequently, to satisfy ourselves that the point of the needle is rightly placed. We need assurance also that its lumen has not become blocked during the progress of the injection. These requirements are met: (*a*) If the injecting apparatus allows us to suck blood back through the needle at will; and (*b*) if we are continually informed that the blood is flowing satisfactorily from the apparatus into the vein. For both purposes the funnel-and-tube system is ill-adapted.

The same criticism applies to the air-pump method which we used for several months. If all goes well it works admirably, but if we fail at first to lodge our needle in the lumen of the vein—or if, subsequently, some obstruction develops owing to the formation of clot in the needle, this pressure system is found to be lacking in adaptability and control. We come then to the third method, which has proved, in our hands, the most satisfactory. The proposal to adopt it for the purpose of transfusion came from our colleague Dr. Alexander Fleming. Although at first sight it may appear a little complicated, a few minutes' practice with it will suffice to put the operator at his ease.

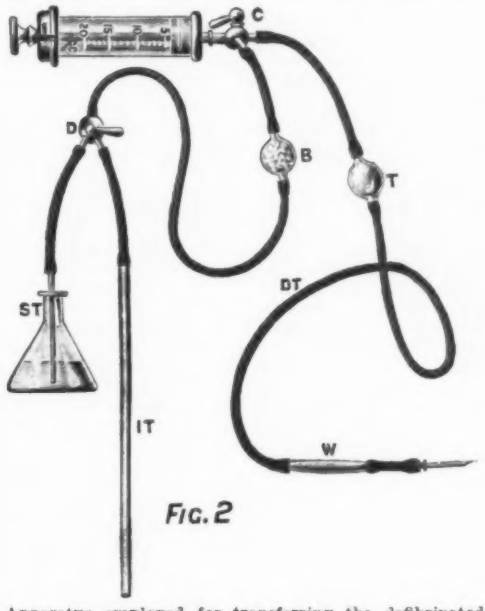


FIG. 2

Apparatus employed for transferring the defibrinated blood from the bottle to the patient's vein.

Apparatus Required.—This is shown in Fig. 2. The essential features consist of a record syringe connected by means of a two-way tap (C) with (I.T.) a thick-walled rubber tube and glass connexion through which the blood is sucked up out of the bottle into the syringe (the "intake tube"); and (D.T.) a second thick-walled rubber tube fitted with a needle—the delivery tube—through which the blood is driven from the syringe into the patient's vein. To these essential features are added one or two simple contrivances which make for convenience and safety in carrying out the injection. They are as follows: (1) On the intake tube is incorporated a glass bulb (B) loosely fitted with glass-wool (*not cotton-wool*, which would soon obstruct the flow of blood). This is intended to catch any small fragment of clot which might be free in the blood. Probably it is unnecessary. We have never seen such loose fragments of clot. (2) On the delivery tube is incorporated another glass bulb (T) which serves as an air trap. If a few bubbles of air should be unwittingly driven over from the syringe with the blood they will lodge in the convexity of this trap while the blood passes along to the needle. (3) At (D) a second two-way tap is introduced, giving connexion by rubber and

glass tubing (ST) to a bottle of sterile physiological salt solution. This provision enables the operator, at the commencement of the injection or at any time subsequently, to fill the delivery tube with salt solution in place of blood. (4) A short piece of glass tubing (W) inserted near the end of the delivery tube serves as a window, the purpose of which will appear when we describe the technique of the injection. (5) Connecting the needle with the end of the delivery tube is a metal "adapter."

Attention may be called to some points of detail in connexion with this apparatus: (*a*) If the syringe is sterilised by sucking hot oil (120° C.) into it it will work much more smoothly than it will after being boiled. (*b*) The needle should be considerably smaller than that employed for taking blood from the donor. A bore of about one millimetre will be suitable. At the risk of pointing out the obvious, we would urge that the operator should not take for granted that its point is sufficiently sharp. If he wishes to avoid trouble he will himself examine it with a hand lens, and, if necessary, touch it up on a fine sharpening stone. (*c*) It is well to ascertain, before commencing the injection, that the nozzle of the syringe makes a tight joint with its two-way tap. (*d*) The joints between rubber tubing and glass, and also those connecting the tubing with the two-way taps, should be secured with a turn of thin wire or a ligature—otherwise, after being sterilised several times, they may leak.

Technique of the Injection.—The sterilised apparatus is first assembled at the bedside, the syringe being connected with its two-way tap (C), the glass tube I.T. being put into the blood through the hole in the bung which until now has been closed with a cotton-wool plug (A), and the other tube (S.T.) placed in the flask of salt solution. The next step is to fill the whole system of tubes—and also the syringe half full—with salt solution. (In order to expel the air from the delivery tube the needle end must, of course, be held up at arm's length while salt solution is driven into it from the syringe.) This done, we are ready to commence the injection. While an assistant compresses the upper arm with his hand (this arrangement is preferable to the use of a tourniquet, as the pressure can be released more promptly and with less risk of dislodging the needle) the operator inserts the needle into the vein at the elbow. As soon as he thinks its point is well in the lumen of the vein a second assistant, in charge of the syringe, pulls lightly on the piston until blood appears at the glass window (W). With this assurance that his needle-point is correctly placed, the operator, still holding on to the needle himself, gives the word for the compression of the upper arm to be released and the injection to begin. A few cubic centimetres of salt solution are first injected in order to give renewed assurance that the needle is still in the vein. The assistant in charge of the syringe then turns the tap C from the delivery tube to the intake tube, and the tap D from the tube S.T. to the tube I.T. and proceeds to fill the syringe with blood. This done he turns the tap C back towards the delivery tube and injects the blood into the vein. By alternate filling and emptying of the syringe in this manner the transfusion is completed. One difficulty only is likely to arise after the needle is satisfactorily lodged in the vein. If, for any reason, there is delay in commencing the injection—or if this is interrupted—a little blood may flow back from the vein into the needle and delivery tube, and, clotting there, prevent or impede the further progress of the injection. The operator has only to be aware of this possibility to avoid its occurrence.

In conclusion we would emphasise the desirability of injecting the blood slowly. On one occasion when we were using the Higginson pump apparatus, most distressing symptoms were caused by inadvertently hurrying the injection of the first 100 c.cm. of blood. It is our practice now to take at least 20 minutes over the injection of 500 c.cm. of blood—the quantity we usually employ.

Results of Treatment by Immuno-transfusion.

It is always a difficult matter to convey in print what is thought to have been achieved by any method of treatment. Either the reader must be given all the evidence on which to form his own judgment—a wearisome and unsatisfactory procedure for both writer and reader—or, failing that, the writer must state broadly his estimate of the value of the method, and, for the reader's guidance in accepting or rejecting that estimate, must indicate the nature of the evidence on which it is based. We shall here employ the latter alternative, and, before referring to the results we have obtained, shall deal briefly with the problem of evidential methods in its bearing upon these results. Sir Almroth Wright has devoted much thought to this problem and we may quote from him as follows:—

"The statistician has done his very best to persuade the world that there is only one way—that being the statistical method—by which the efficacy of a therapeutic method can be scientifically put to the test. The statistician asserts that there should in connexion with every therapeutic method be set out the results of a long series of cases treated, and that there should be compared with these results those of a similar series of untreated control cases. This method, except in connexion with very common and comparatively light infections (where no one is going to go to the trouble of applying it) is not only impracticable but almost inevitably fallacious. It is impracticable (*a*) because of the difficulty of assembling, unless we include all grades of infection and patients affected with all sorts of complications and accessory infections, sufficient cases for statistical operations; and (*b*) because of the all but impossibility of providing, by withholding treatment from a very large number of patients, the theoretically necessary number of control cases. And statistical treatment is almost inevitably fallacious because when we take an assortment of patients suffering from all different grades of infection, different complications and accessory infections (to say nothing of a percentage of patients wrongly diagnosed), and now proceed to divide these by any system into two groups, we shall almost inevitably have two groups which would not, if they had both been left to themselves, have furnished the same results. We may in view of this be devoutly thankful that there are non-statistical methods by which the efficacy of therapeutic measures can be tested.

"(1) Clinical evidence of the efficacy of a therapeutic measure is furnished by a cure effected in an intractable and progressive local infection, and by rescue from death in a plainly desperate case. But the evidence must not be limited to the citation of only one or two of such cases, for provision requires to be made for an occasional profound blunder in prognosis, and for the possibility of some undiscerned factor other than the treatment applied having been responsible for the transformation in the patient's condition. The difficulty of furnishing convincing testimony of dramatic improvements, and cures produced in hopeless cases will consist in the difficulty in finding words (for photographic records will only rarely be available)—words graphic enough to depict to the reader the desperate conditon of the patient when treatment was initiated and the resurrectional change that followed. Where verbal description is inadequate and photographic records are not available, the reader will have to be largely guided by his estimate of the trustworthiness and sobriety of judgment of the reporter.

"(2) To the clinical evidence furnished by cures of intractable and progressive local infections or rescues from death supervening in desperate conditions there can be superadded immunological data procured by measuring the antibacterial power of the patient's blood before and after treatment, and by measuring, in addition, when immuno-transfusion or serum-therapy is in question, the antibacterial power of the blood or serum injected. When such data testify to an improvement in antibacterial power following directly on treatment, and when they further show in connexion with immuno-transfusion or serum-therapy that the blood or serum incorporated was calculated to produce such a result, a previously existing strong presumption that the benefit witnessed resulted from the treatment will (for the man who consents to regard immunological data) be converted into a practical certainty.

"(3) Additional but not conclusive clinical evidence of the efficacy of a therapeutic measure is furnished by rapid and striking recoveries supervening upon treatment in serious but not desperate local and general infections, and by unambigious temporary improvements in cases which afterwards terminate fatally.

"(4) The evidential force of such clinical data is increased when these are supplemented by immunological data which show that treatment was regularly followed, and improvement preceded, by a marked increase in the antibacterial powers of the blood.

"The rôle of immunological data in the appraisement of value of therapeutic measures will have become clear. In the case where a cure has been obtained immunological data can, as we have seen, convert the presumption that the cure is due to treatment into a certainty. They can also render invaluable logical service by silencing the witticisms which make merry over the idea that it can, under some circumstances, with propriety be claimed in connexion with a patient who has succumbed that the therapeutic measures applied effectually did their office. Immunological data not only put a quietus upon such witticisms, but moreover they bring home the fact that no achievement of increased antibacterial powers is of any permanent avail when we are dealing either with a disseminated infection which is disproportionately large in comparison with the antibacterial forces we can bring against it, or with an unevacuated nidus of infection which goes on poisoning the blood."

With these considerations before us we may now briefly summarise the evidence afforded by our records that immuno-transfusion has been of value. The cases referred to have either been treated by us or have come closely under our cognisance.

(1) Of "plainly desperate cases" in which rapid improvement or definite cure has been obtained we have three records. One case was that described by Sir Almroth Wright in 1919, of severe streptococcal infection of the sacrum and ilium, to which reference has already been made. Another was the case of mastoid suppuration and lateral sinus thrombosis (streptococcal infection) referred to in the recent paper by Wright, Colebrook, and Storer (THE LANCET, 1923, i., under Example 3, p. 476). In this case immunological data (determinations of the strepto-phagocytic power) enabled us to correlate the patient's quite astonishing recovery with an increase of protective substances in the blood.

The third case, under the care of our colleague, Dr. John Freeman, was that of a lady, aged 74, who, following upon a mosquito bite, developed a very severe streptococcal cellulitis of the forearm, which soon extended to the upper arm and axilla. In spite of very free multiple incisions, the cellulitis was not checked and the erysipelas which accompanied it began to invade the trunk. The surgeon who was called in decided that amputation must be done in order to save life, but when he arrived to perform it the patient's condition was so grave that he judged her chance of surviving the operation was too slight to justify it. The case was therefore regarded as quite hopeless when Dr. Freeman was asked to see her. A culture he made from the arm yielded a pure and copious growth of streptococcus, and on testing her blood he found that the smallest addition of vaccine only served to reduce its already feeble phagocytic power. He therefore decided upon immuno-transfusion. The day following this treatment the patient's condition was already better and from that time she made good progress, the erysipelas subsiding, and no further operative treatment being required. After ten days a swab from the wounds on the arm yielded no culture of streptococci.

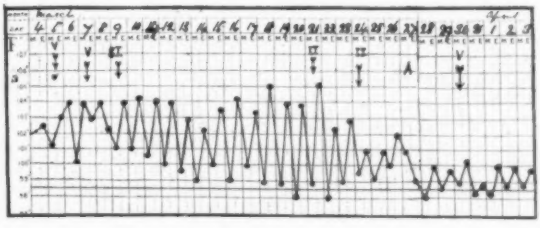
In addition to these three desperate cases which recovered we may refer very briefly here to a case of malignant endocarditis in which only temporary but nevertheless striking improvement was obtained. The patient was a man, aged 56, who had been ill with irregular fever for 12 weeks before treatment was begun. Streptococci were grown from the blood in considerable numbers on several occasions. After three immuno-transfusions at intervals of two to three weeks, and a few intravenous doses of vaccine, his temperature came to normal and kept down for several weeks, his general condition showing a corresponding improvement. The blood-stream was, however, never freed from Streptococci, and the patient finally died from circulatory collapse.

Turning now to the cases we have treated which may be grouped under the heading "serious, but not desperate infections" (Classes 3 and 4 above) we find in our records nine cases in which evidence of the value of immuno-transfusion was furnished by rapid and striking improvement, and, in some of them, also by immunological data. The salient features in respect of each of these cases were as follows:—

CASE 1.—A very grave case of staphylococcal osteomyelitis under the care of Mr. Maynard Smith. Both femora, one fibula, and the phalanges of one finger were affected and the boy had already developed pneumonia. Twenty-four hours before the transfusion his life was almost despaired of, but he rallied slightly, and following the injection of blood there was—to quote Mr. Maynard Smith's words—"a great and immediate improvement." From that time the boy held his own, but recovery was necessarily slow. There was a slight recrudescence of infection three months later. (The immuno-transfusion in this case was carried out by our colleague Dr. Porteous.)

CASE 2.—A child suffering from a generalised streptococcal infection with abscesses in the elbow-, ankle-, and wrist-joints. It will be seen from the accompanying temperature chart (Fig. 3) that two intravenous doses of vaccine and also a simple transfusion—i.e., of unimmunised blood—had failed to influence the infection and that a very

FIG. 3.



V, inoculation of vaccine. S.T., simple transfusion, 20 c.cm. I.T., immuno-transfusion, 25 c.cm. A, abscess of elbow-joint opened.

satisfactory improvement followed the two injections of immunised blood, even in spite of the fact that an abscess remained unopened in the elbow-joint. When this focus was dealt with the boy's condition improved still further and he completely recovered. Some immunological data relating to this case will be found in the paper by Wright, Colebrook, and Storer, p. 476.

CASE 3.—A case of osteomyelitis of the frontal bone. Striking improvement followed the transfusion and the patient continued to do well for some time. Eventually an abscess developed and the patient did not long survive the operation undertaken to deal with this. The increased hæmo-bactericidal power of the patient's blood 24 hours after the transfusion and also that of the donor after immunisation are shown on p. 476 of the paper just referred to (*supra*).

CASE 4.—A case of puerperal infection. (Blood culture negative.) The temperature fell after the first transfusion, but rose again some days later. Complete recovery after a second immuno-transfusion.

CASE 5.—Female. Very severe streptococcal cellulitis of hand and arm, progressing in spite of multiple deep incisions. Condition considered critical. Remarkable improvement immediately during the 24 hours following immuno-transfusion and uninterrupted recovery.

CASE 6.—A boy suffering from septic infection of stump (streptococcus infection) following amputation through upper third of humerus for trauma. His condition caused anxiety, but began to improve at once after immuno-transfusion. Complete recovery.

CASE 7.—Male, with portal pyæmia following appendicitis and cholecystitis. Made good progress for several days after immuno-transfusion. He was extremely ill at the time of the transfusion, but held his ground and certainly improved somewhat during the following four days. Unfortunately, on the fifth day the sutures of his abdominal wound cut out and he did not long survive the operation required to deal with this.

CASE 8.—Male, with acute streptococcal epidemic infection (which resulted in three deaths). Patient had high fever but no localising signs. Blood culture negative. His condition was much improved on the day following immuno-transfusion and the temperature came to normal within 36 hours.

CASE 9.—Female. Severe puerperal infection. Pelvic cellulitis. Clinical improvement followed immuno-transfusion and was correlated with improved hæmo-bactericidal power (see below). Condition subsequently grew worse;

patient refused further treatment. Post-mortem revealed thrombus in inferior vena cava. The following experiment shows increased hæmo-bactericidal power to Staphylococcus of patient's blood 24 hours after immuno-transfusion. (Slide cell method.)

TABLE VI.

Patient's blood before immuno-transfusion.			Patient's blood 24 hr. after immuno-transfusion.		
No. of staph. implanted in the blood.	No. of colonies which grew in the blood.	Staph. killed by the blood.	No. of staph. implanted in the blood.	No. of colonies which grew in the blood.	Staph. killed by the blood.
		Per cent.			Per cent.
—	—	—	2000	55	97
(1000)	182	81	1000	33	96·7
(500)	88	82	496	11	97·8
(250)	43	82	248	9	96·4
(126)	27	78	124	5	96
—	—	—	52	4	92
—	—	—	26	3	88
—	—	—	13	0	100

In addition to those specified above we have records of seven cases which did not furnish any evidence that immuno-transfusion was of value. These were as follows:—

(*a*) A case of malignant endocarditis in a child associated with an unusually heavy infection. (Blood cultures when the patient first came under treatment yielded 76 colonies of streptococci per cubic centimetre of blood, and later on the number increased to 200.)

(*b*) A patient with colitis of many months' standing, who was absolutely in extremis when the transfusion was carried out, being too weak to speak, and incontinent.

(*c*) A case of puerperal pyæmia with very large abscesses which could not be adequately drained.

(*d*) A case of streptococcus septicæmia occurring in a very debilitated subject already suffering from generalised eczema and cellulitis.

(*e*) A case of puerperal septicæmia in the country whose general condition was extremely bad as the result of continued high fever for seven weeks and many rigors.

(*f*) A case of very advanced phthisis with laryngitis.

(*g*) A case of chronic mucous colitis of the neurasthenic type. There was no sufficient indication in this case for immuno-transfusion, which was carried out rather as a policy of despair—the patient having failed to respond clinically to vaccine-therapy and other forms of treatment.

In conclusion, we may remark that the results so far obtained represent only a beginning. It is quite possible, indeed probable, that with increasing knowledge we shall be able in the future to effect a still greater immunisation of the donor's blood and achieve with it correspondingly better therapeutic results.

Grateful acknowledgments are made to Sir Almroth Wright for his continual help and criticism; to Dr. H. B. Maitland, who worked with us for some months and to whom we are indebted for the records of several experiments; to Mr. Alexander Fleming for suggestions in connexion with technique; and to Dr. Freeman and Dr. Porteous for particulars of cases treated by them.

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8. Robertson, O. H.: Brit. Med. Jour., 1918, i., 477.
9. Fleming, A., and Porteous, A. B.: Blood Transfusion by the Citrate Method, THE LANCET, 1919, i., 973.
10. Fleming, A., and Colebrook, L.: THE LANCET, 1911, i., 1631.

Glasgow Northern Medical Club held their annual At Home on Dec. 11th in the Grand Hotel. The gathering was large and representative, and a very enjoyable evening was spent.

THE TREATMENT OF LIVER ABSCESS BY ASPIRATION.

BY A. R. NELIGAN, M.D. LOND.,
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I HAVE read recently in THE LANCET[1] the paper by Manson-Bahr, Low, Pratt, and Gregg on the treatment of liver abscess by aspiration. The writers are to be congratulated on their excellent results in the 15 cases described, and on the way in which they have set them out. My experience is not as great as theirs, but as I am a firm believer in the aspiration treatment I may be allowed to express my agreement with their methods. Indeed, almost the only criticism, if criticism it be, that I have to make on this excellent paper is one of surprise that its authors should have felt obliged to insist so strongly on its advantages as compared with open operation. Is not the aspiration treatment firmly established in tropical practice? And has it not been so, not "recently," but ever since the publication of Rogers's work—that is to say, for the last 10 years? Personally on reading his book, "Dysenteries," in 1913, I adopted the method and quickly became convinced of its value. As I write, however, I am reminded of two facts which suggested to me at the time that the aspiration treatment had not come into its own; one was Lieut.-Col. E. O. Thurston's analysis[2] of a series of cases of liver abscess treated in Bengal hospitals by open operation with 40 per cent. mortality; the other was that when last on leave I was asked to read a paper on the method. I desire, therefore, most emphatically to subscribe to all the statements made by Manson-Bahr and others. There is no doubt that, both for patient and surgeon, the aspiration treatment is preferable in every way for the very great majority of liver abscesses to open operation. I feel, indeed, that, with the exception to be described below, to open one is as much to be avoided as to open a tuberculous abscess. On the one side there is, or may be, a difficult operation under general anæsthesia, with a definite operative risk, a long period of convalescence, with daily expensive dressings and complicated endeavours to maintain asepsis and too often secondary infection, and, in the case of debilitated patients, death. On the other side there is a puncture (with or without local anæsthesia) and a collodion dressing, which may have to be repeated once, or in some cases twice or thrice. In the intervals the patient lies in bed undisturbed and free from pain, receiving his emetine injections, and causing neither anxiety nor trouble. The exception mentioned above is the abscess in the epigastric or hypochondriac regions, which presents no definite evidence of having formed adhesions with the parietes. Here it is safer to incise the abdominal wall, pack off the peritoneal cavity, and drain.

Technique.

As regards operative technique I have little to add to what is recommended in the paper quoted.

Site of Operation.—Under "swelling" is no doubt included pitting of the skin on pressure, a most important and helpful sign when present. In the absence of localising signs, and after unsuccessful punctures at other sites, one should always be made near the angle of the right scapula. This, I think, is mentioned in Manson's book. I remember assisting at an operation when several unsuccessful punctures were made in the lateral and anterior surfaces of the liver; the abdomen was then opened, and still no abscess was found. Finally a puncture was made near the angle of the right scapula and pus withdrawn at once.

I have rarely used general anæsthesia. A small skin incision or stab wound with a tenotomy knife makes the introduction of the large trocar of an aspirator easy. There is no pain once the body wall has been traversed. The statement that it is not necessary to inject a solution of quinine or of emetine into the abscess cavity after the pus has been

[1] THE LANCET, 1923, i., 941. [2] Indian Med. Gaz., 1914, i., 88.

aspirated, as recommended by Rogers, is interesting. I have notes of a small acute abscess which recovered without their use after withdrawing only a drachm of pus with an exploring syringe. In future I shall treat some of these cases without injections into the cavity, but I do not think I shall omit them in the case of patients who are very weak or who have not received some emetine before aspiration. I have seen two cases in which there was a secondary infection, one with a streptococcus, the other with a bacillus and a diplococcus, and in which therefore I did not expect a very favourable result. Did the injection of a solution of quinine into the abscess cavity help towards their recovery? "The effusion of serum into the abscess cavity probably takes place normally, and should be regarded as the natural method of repair." My experience corresponds with the first half of this sentence, but the effusion has on several occasions been accompanied by a rise in temperature, and this fell after a second aspiration. The serum was stained with altered blood and contained no formed elements. I, too, have never seen symptoms which could be set down to internal hæmorrhage, after exploring the liver with either needles or trocars.

Diagnosis.

The frequent absence of a leucocytosis in abscess of the liver is well emphasised in the paper. It is a most important factor for those who are beginning tropical practice to learn. Lesions of the pleura at the right base, be they a recent small serous effusion or a chronic empyema, may cause difficulty in a country where abscess of the liver occurs. Tenderness on pressure between the ribs occurs in both conditions (a fact which, by the way, I have not seen mentioned in text-books), and it is a classical sign in hepatitis. On the other hand, an abscess in the upper posterior part of the right lobe of the liver may cause displacement of the heart's apex beat, to say nothing of dullness and weak breath sounds. Indeed, in the case of empyema, there may be doubt even after finding pus with the needle, for liver pus is not always of the anchovy colour. In yet other cases there may be a lesion of the pleura together with an abscess of the liver. The patient is frequently a villager from some distant part, and the history often of no assistance. Returning to that important physical sign, tenderness on pressure between the ribs (present in the majority of cases of hepatitis, and often the sole indication as to where to explore), it may in some cases seem to fail us. It is not easy for a patient of low intelligence to distinguish between a superficial pain caused by squeezing the integuments between finger and rib and the deep tenderness due to pressure on an inflamed organ. Indeed, people who are very ill and thin may complain of pain at whatever point of the body pressure is made. In these circumstances I find it useful to explain as clearly as possible that I am searching for deep tenderness, and then to compare the two sides of the chest, examining methodically the intercostal spaces with the same degree of finger pressure. In this way the patient learns what is the sensation due simply to pressure on skin and rib, and whether, on one side or the other, there is an added discomfort, which he may now be able to say is definitely deeper than the surface.

Altogether the region of the diaphragm presents some of the most interesting problems in clinical diagnosis, especially when a patient comes during one of the apyrexial intervals which may occur during the course of a hepatic abscess. The X ray screen must be a great help in the diagnosis of the various conditions found here, but I have not had the advantage of being able to use it.

In concluding I would like to describe shortly three cases which bear further striking testimony to the value of aspiration and which show that it is sometimes necessary to remove collections of serum.

CASE 1.—Cultivator. Seen August 23rd, 1918. Abscess right lobe of liver; no leucocytosis; 75 ounces of pus aspirated same day (emetine gr. 2). On the 31st temperature rose to 100° F.; 16 ounces of serum aspirated (quinine gr. 10). Temperature fell to normal, and patient insisted on leaving hospital on Sept. 4th as he "felt so well."

CASE 2.—Labourer. Seen May 9th, 1919. Abscess left lobe of liver and of spleen; leucocytes 8000; 62 ounces of pus aspirated on the 13th; trocar entered in middle line of abdomen 2 inches below xiphisternum (emetine gr. 2). Pus again aspirated from the left lobe on the 25th 14 ounces (quinine gr. 10), on June 25th 6 ounces (emetine gr. 2), and July 4th 6 ounces (quinine gr. 5). The patient has been seen recently and has been well in the interval.

CASE 3.—Hod-carrier. Seen May 27th, 1919. Abscess right lobe of liver; leucocytes 5600; 37 ounces of pus aspirated same day (emetine gr. 2). On June 16th, 27 ounces aspirated (emetine gr. 2). On the 20th (emetine gr. 1) and 26th, and on July 12th (quinine gr. 10), temperature rose and blood-stained serum was aspirated on each occasion, with consequent drop in temperature to normal. There were probably two large abscesses in this case. This patient has been seen recently for myocardial trouble; he is otherwise well and has been hod-carrying.

The amounts of emetine and quinine mentioned were injected through the trocar before withdrawing it from the abscess cavity. Case 2 is remarkable for the fact that there were abscesses of the left lobe of the liver and of the spleen, which were in communication and which were emptied at one aspiration. The splenic abscess did not refill, but that in the liver required subsequent treatment.

A NOTE ON A RARE FORM OF CONGENITAL CARDIAC ABNORMALITY.

BY EDITH F. WILLOCK, M.B. DUB., D.P.H.,
RESIDENT MEDICAL OFFICER, MANCHESTER BABIES' HOSPITAL.

THE interest of the following case lies in the peculiar cardiac condition present, which was associated with a duration of life of over three months.

The Case Described.

A male child, aged 3 months, was admitted into hospital as a "cardiac case." The history was that the infant's colour had always been bad, and that he had suffered from constant dyspnœa, which was greatly increased when fed; there had been no dyspeptic symptoms, but the child had not thrived normally. The family history was negative.

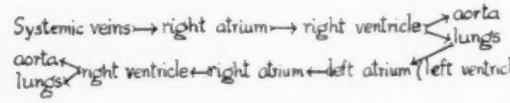
Condition on Admission.—The patient was a small wasted infant, who looked very ill; the colour was ashy grey, the eyes sunken, fontanelle depressed, respirations rapid and laboured, pulse very rapid and feeble, and temperature subnormal. Examination showed that the area of cardiac dullness was increased to the right of the sternum, the apex beat was displaced downwards and outwards, and a diffuse epigastric pulsation was present; on auscultation no cardiac murmurs were audible, and pulmonary examination revealed nothing abnormal.

Course of Case.—The infant was given two-hourly feeds of breast milk, which he took with great difficulty; when fed the colour at once became worse and slightly cyanotic, and the respirations grew very rapid and laboured; this distress gradually abated after the completion of the feed, but oxygen and brandy had to be administered during each meal, and occasionally camphor and strychnine given in addition. During the next few days the infant's condition improved slightly, and milk was taken with less difficulty. On the fifth day, however, the temperature rose to 101° F. and a cough developed; on examination of the chest a few râles were audible in the left axilla, and the breath sounds generally were harsh. On the following day the infant was much worse, the temperature rose to 104° that evening, and death occurred six hours later.

Post-mortem Examination.—There was an abnormal quantity of pericardial fluid present, and the heart itself appeared flattened from above downwards. The great vessels looked normal, except that the aorta was small compared with the pulmonary artery; the condition of the ductus arteriosus was, most unfortunately, not investigated. The right atrium was dilated and hypertrophied, and communicated with the left atrium through a patent foramen ovale; the right atrio-ventricular orifice was large with somewhat nodular valves, but was apparently competent. The right ventricle was greatly dilated and hypertrophied, while both aorta and pulmonary artery sprang from the conus arteriosus; no inter-ventricular foramen was present. The left atrium was small with a large auricular appendage; the foramen ovale was patent, and the left atrio-ventricular orifice was small and ring-like, with obviously functionless valves. The left ventricle was very small (about one-eighth the size of the right), and its only communication

was with the left atrium through the atrio-ventricular orifice. The aorta originated from the right ventricle, commencing posteriorly and to the right of the pulmonary artery; it was somewhat small in size, but with normal valves. The pulmonary artery was large and normal as regards its valves. The lungs were congested, and showed evidence of slight bronchitis; the only other abnormality present was a complete mesenteric attachment to the whole of the large intestine. The blood from the systemic veins reached the right ventricle from the right atrium, its passage to the left atrium through the foramen ovale being prevented by the valvular formation of that opening. The right ventricle then drove the blood through the aorta and pulmonary artery to the systemic and pulmonary circulations. From the lungs the blood returned through the normal pulmonary veins to the left atrium, and thence by the foramen ovale to the right atrium, the left ventricle being merely an appendage of the left atrium and the left atrio-ventricular orifice functionless.

The schema of the circulation was as follows:—


Systemic veins → right atrium → right ventricle → aorta
lungs
aorta
lungs → right ventricle ← right atrium ← left atrium (left ventricle)

The heart was carefully examined for the presence of inter-ventricular foramina, but the inter-ventricular septum was complete and well developed. Evidence of the normal origin of the aorta was also sought for, and two or three shallow recesses were found in the left ventricle, in the region from which the aorta should have arisen; there was, in addition, an ill-defined recess in the right ventricle leading from the base of the aorta, backwards and to the left, towards the small left ventricle; these were, however, only cul-de-sacs.

It is probable that the ductus arteriosus in this case was patent, since, the pressure in the aorta and pulmonary artery being equal, the lungs would have suffered greatly from the high pressure, and the small aorta would have proved insufficient for the needs of the systemic circulation, had not such a safety-valve been present.

Commentary.

The most interesting points in this case were, therefore, as follows. The inter-ventricular septum was complete, showing no defects at all; the left ventricle communicated only with the left atrium, of which chamber it was merely a recess; and the aorta and pulmonary artery both sprang from the conus arteriosus of the right ventricle. To attempt to explain these anomalies it would appear necessary to assume an almost complete failure of development of the proximal bulbar septum, with secondary closure of the resultant defect in the inter-ventricular septum, the two ventricles being thus completely separated. The patent condition of the foramen ovale is a less rare occurrence, but it is interesting to note that in this case the blood passed through the aperture in the reverse direction to that of the normal fœtal stream.

There are a few cases on record which somewhat resemble the one described above. Keith[1] described a similar condition, but the infant only lived for two days; the cardiac malformations consisted of stenosis of the aorta, obliteration of the left atrio-ventricular orifice and left ventricle (traces only of this chamber remaining), a small left atrium, a patent foramen ovale, dilated right ventricle, patent ductus arteriosus, and partial transposition of the great vessels. Dudzus[2] collected records of a series of congenital cardiac abnormalities, three of these in particular (those of Jost, Theremin, and Spolverini) show a marked similarity to the case recorded here. The condition I have described is, according to Abbott in Osler and McCrae's "System of Medicine," one of the rare cases of true cor triloculare biatriatum, showing two fully developed atria, a patent foramen ovale, a single functioning ventricle from which both great vessels spring, and a rudimentary left ventricle which is merely a recess of the left atrium.

I am greatly indebted to Dr. Nesta Perry for her permission to publish this case.

[1] Keith, Sir A.: Jour. Anat. and Physiol., 1912, p. 211.
[2] Dudzus, M.: Virchow's Archiv f. Path. Anat. Berl., 1922, ccxxxvii., 32.

Medical Societies.

LIVERPOOL MEDICAL INSTITUTION.

A PATHOLOGICAL meeting was held on Dec. 6th. A number of specimens were shown and a short discussion followed.

Prof. E. GLYNN, in association with Prof. J. HILL ABRAM, communicated a note on a case of

Acute Miliary Tuberculosis Complicated by an Anaerobic Infection.

The patient, a male aged 19, had suffered from "influenza" twice during the past year and pleurisy once. Weakness had been increasing for six weeks before admission and he died three days later, the temperature ranging from 103°–105° F. The lymph glands and spleen were enlarged, but there were no other signs except a systolic cardiac murmur at the apex. Blood cultures yielded *Staphylococcus albus* consistently. Red blood cells were 3,000,000 with a few megalo- and normo-blasts. The white cells were 12,000 per c.mm. with a preponderance of lymphocytes. At the post-mortem, 11 hours after death, the ileo-cæcal glands formed a mass the size of a hen's egg, were hæmorrhagic, and swarming with tubercle bacilli. They also grew *Staphylococcus albus*. All other lymph-glands were somewhat enlarged. There were gas bubbles in the portal system and large numbers of Gram-positive bacilli in the liver, which proved to be of the *B. aerogenes capsulatus* type. The liver showed typical caseating tuberculous nodules as well, and it contained hæmosiderin. The lungs showed a patch of grey hepatisation in which great masses of organisms resembling pneumococci were present. A similar case of miliary tuberculosis affecting mainly the mesenteric glands, but without *B. aerogenes capsulatus* infection, was described. This patient had not the anæmia of the pernicious type found in the former case. Of the four organisms found at death, the anaerobe was the most likely to have caused this anæmia. Other cases suggesting blood infection with anaerobes during life were quoted to confirm the speaker's opinion that in this case the anaerobe was present in the blood during life.

Prof. HILL ABRAM and Mr. J. T. MORRISON believed the infection was probably terminal, the latter mentioning that the typical blood picture seen in aerogenes infection was not present.—Prof. J. M. BEATTIE thought that the multiplicity of organisms present might explain the rapid multiplication of tubercle bacilli.

MR. MORRISON read a short paper on the

Differentiation of Human and Bovine Tubercle Bacilli.

Alluding to the need for a reasoned consensus of opinion on this subject, he proceeded to sketch the differences recognised between the two types, and showed illustrative specimens of cultures and animal inoculations. Attention was drawn to the variations in results even in animal inoculations. Dean and Todd, and others too, had shown that Koch's original statement that animals could not be infected with human bacilli was not accurate. In the rabbit the results of inoculation were usually conclusive, but variations were also suggested that the number of organisms injected might materially influence the decision. With regard to the question of the stability of types the findings of the Royal Commission on Tuberculosis were quoted, and the importance of the exceptional cases pointed out, where by passage or culture definite changes in type had been produced. These observations supported the view of Besson and others that the two organisms were essentially one, to which view the author tended to adhere. At the same time in animal inoculation we had a means of determining with considerable accuracy the immediate source of the infecting bacillus, and on such conclusions it was justifiable to base public policy in the campaign against tuberculosis.

LONDON ASSOCIATION OF THE FEDERATION OF MEDICAL WOMEN.

A MEETING was held on Dec. 11th at the Elizabeth Garrett Anderson Hospital, with Miss M. CHADBURN the President, in the chair.

Dr. AGNES SAVILL read a paper on the

Sun Treatment of Tuberculosis at Leysin.

Dr. Savill said that a happy chance had led her, while enjoying a holiday in Switzerland, to visit the now world-famous clinic of Dr. Rollier, and spoke of the pleasant and inspiring experience that awaits any medical practitioner who attends the summer course of lectures and demonstrations there. Dr. Savill dealt with the subject mainly from two aspects. In the first place she gave a vivid description of the clinics (Les Frênes and the Châlets), making her hearers see in imagination the spacious balconies, the clear and artistic rooms, filled with the morning sun, the happy patients, the brown and laughing children playing naked in the snow, and emphasising above all the pervading spirit of human comradeship and cheerful helpfulness which pervades the whole organisation. In the second place she dealt with the more purely scientific aspect of the treatment. The physical properties of light were briefly discussed, with its bactericidal and chemical powers. It was pointed out that the ultra-violet rays, though apparently of low penetrating power, yet seemed of great therapeutic importance, and it was suggested that their wave-length might be modified by passage through the pigment-containing basal layers of the epidermis. That the good results are due to the sunlight itself rather than to the pure air and good conditions was indicated by the fact that the results seemed to be distinctly poorer in cloudy weather, and also that very severe reactionary effects could be produced by improper or careless dosage. A point to be emphasised was that light, like any other therapeutic agent, requires careful regulation, the dose being studied for the individual and based on the measurement of definite reactions (e.g., rise of temperature, dermatitis, exhaustion, &c.). It was worthy of note how health was maintained by the action of the light alone, the patient being entirely at rest and no massage being used. Dr. Savill also dealt with the various artificial substitutes for sunlight, which could be used in this country. The principal ones discussed were the carbon arc lamp, which was giving good results at the London Hospital at the present time, the mercury-vapour lamp, and the tungsten arc, this last giving the greatest proportion of ultra-violet rays and requiring therefore short exposures. In conclusion, Dr. Savill emphasised the need for accurate dosage of sunlight, for a pure atmosphere, and for a lengthy treatment, if a successful result was to be obtained.

Discussion.

Dr. KATE PLATT read some notes sent by Dr. FLORENCE STONEY on several cases she had treated at Bournemouth with good results.—Dr. CHARLOTTE BROWN said that her experiences at Leysin confirmed Dr. Savill's, and dealt with the sun treatment in England, when supplemented by arc-lamp treatment in the winter.—Dr. HELEN MACKAY spoke of the experimental side of the question of the action of light and described her experiences in the investigation and treatment of rickets, both in Vienna and London.—Miss IDA C. MANN described a case of Dr. Rollier's which she had followed, and discussed the results of the treatment at present being obtained at the Royal Sea Bathing Hospital, Margate, which she had had the opportunity of visiting.—Dr. LUCY NASH inquired as to the cost of substitutes for sunlight.—Mrs. HANDLEY H. READ asked whether treatment by light had any action on pyorrhœa alveolaris.

The questions of the relation of impure air to tuberculous cervical adenitis, and the advisability of improving the health of the school child in this respect, and also the practical side of treatment and prophylaxis in England, and the type of patient most likely to be benefited by treatment, were discussed by various speakers, among whom were Dr. OCTAVIA LEWIN, Dr. M. DOBBIE, Dr. L. M. POTTER, and Dr. C. A. S. FITTER.

EDINBURGH OBSTETRICAL SOCIETY.

A MEETING of this Society was held in the New Gallery, Edinburgh, on Dec. 12th, Prof. B. P. WATSON, the President, being in the chair.

Exhibition of Specimens.

The following specimens were exhibited:—

Dr. WILLIAM FORDYCE: Large fibroid tumour of cervix, weighing 16½ lb. at time of removal.—Dr. J. LAMOND LACKIE: (1) Uterus with multiple fibroids, removed after expulsion of a four months' fœtus; placenta in situ. (2) Uterus with multiple fibroids; Cæsarean section done in full-time pregnancy. Hysterectomy performed on account of pain.—Dr. W. F. T. HAULTAIN: Fibroid tumour simulating a horn of a bicornuate uterus.—The PRESIDENT: (1) Uterine fibroid with sarcomatous change; (2) uterine fibroid with carcinomatous invasion in a patient with carcinoma of vulva and of cæcum; (3) fibroid pushing cervix up on to the pubis removed at fifth month of pregnancy; (4) dermoid tumour of ovary with twisted pedicle simulating pelvic abscess and removed per vaginam.

Dr. F. J. BROWNE read a paper on the

Induction of Labour by Quinine and Pituitrin.

He began his address by referring to the researches of Oliver and Schafer, Dale and Blair Bell concerning the discovery of the drug and its action in causing uterine contraction, and went on to speak of the investigations of Fries, Haugh and Meyer, Stein and Dover, Cron and of B. P. Watson in inducing labour by its agency. In 1922 Watson had published the results obtained in a series of 195 cases, in 90 per cent. of which labour was induced with no maternal mortality and a fœtal death-rate of 6 per cent., nor could any of these deaths be fairly attributed to the use of pituitrin. The present communication was based on a series of 44 cases. Most of these had suffered from purulent vaginal discharges, and were therefore unsuitable for mechanical methods of induction. The technique employed was that advised by Watson. The indications included disproportion at term, primiparity, post-maturity, toxæmia, and hydramnios; 27 of the patients were primigravidæ, the others multiparæ; 23 of the patients were at term, three were post-mature according to the estimated dates, and 18 were premature. Out of the 44 cases, 40 were successful—i.e., a little over 90 per cent. All the failures occurred in cases where premature labour had been attempted. With regard to the time taken to start and complete labour, counting from the first dose of quinine, the average time taken till the onset of labour averaged 29 hours, and the average duration of labour was 16 hours. In the premature cases the average time taken till the onset of labour was 39 hours, and the average duration of labour nine hours. In spite of the numerous objections urged against the use of pituitrin for this purpose, the only misfortunes the speaker had experienced were two cases of tetanic contraction of the uterus. In both cases the spasm was effectually controlled by chloroform, but in one case the child was stillborn. While 26 of the patients had suffered from purulent vaginal discharges, only three patients showed a rise of temperature in the puerperium, and in no case was this prolonged into a second day. In four cases the child had been stillborn; in only one case, however, the case of tetanic contraction referred to, could this be attributed to the use of pituitrin.

Dr. FORDYCE read the notes of a case of rupture of the uterus, following the administration of pituitrin for the induction of labour. A discussion followed.

Reviews and Notices of Books.

HISTORY OF THE GREAT WAR.

Medical Services: General History. Vol. II. By Major-General Sir W. G. MACPHERSON, K.C.M.G., C.B., LL.D. London: H.M. Stationery Office. 1923. Pp. 510. 21*s*.

THE second of four volumes on the General History of the Medical Services, forming part of the official medical history of the war, is exclusively the work of Sir William Macpherson, as was the first volume on the general history published two years ago.[1] There remain two volumes of general history, which have been prepared, though some time will elapse before they can be published. These will close the series apart from the volume on Statistics, which is being undertaken by the Ministry of Pensions. The present volume deals with the medical services of the British Expeditionary Force in France and Belgium down to the Battle of Loos, and has been compiled entirely from war diaries, including diaries of the administrative medical services, and from official despatches. At the outset of the campaign, without carefully prepared schemes and organisation, so as to ensure the rapid collection and evacuation of the wounded, confusion and delay were inevitable, and here the importance of administration in the employment of the medical services in war is emphasised. During the earlier operations, while the work of organisation was going on, the field medical units of divisions were most in evidence; for until the Expeditionary Force had been formed into armies, each with casualty clearing stations and motor ambulance convoys allotted to it, it was difficult to carry out schemes for methodically receiving and evacuating sick and wounded. But in the succeeding years the casualty clearing stations became the chief centres of the medical work with the field armies, and "when put to the practical test of war" fully justified their description in the field service regulations as "the pivot on which the whole system of collecting and evacuating sick and wounded turned." Hence the chapters on the later battles emphasise more the strategical employment and work of those units than the tactical employment of the field ambulances, which were acting under divisional control along normal lines.

The volume contains a number of illustrations and many carefully prepared charts and plans. Six large maps, unbound, are included in a pocket of the cover. It is understood that separate histories of the Medical Services of the Dominion Contingents are in course of preparation.

TEXT-BOOK OF CLINICAL PERIODONTIA.

By PAUL R. STILLMAN, D.D.S., and J. O. MCCALL, A.B., D.D.S. New York: Macmillan Co. 1922. With 79 Illustrations. Pp. 240. 16*s*.

FOR the benefit of the English reader unversed in the newer developments of dental terminology in America it may be as well to state that by "periodontia" is meant the branch of dentistry concerned with the treatment of "periodontoclasia." The latter term can be translated into the familiar words pyorrhœa alveolaris. While we may agree with the authors that this phrase is pathologically inaccurate, it is doubtful whether it can be replaced at this stage. Many strange words, indeed, appear in this book, such as "apoxesis" (the operation of scaling the teeth) and "ula" (the gum), and the authors find it necessary to devote a whole chapter to nomenclature. We deplore this invention of new and unnecessary words when others exist with the sanction of long usage. It darkens counsel and may, as Voltaire reminded us, conceal a poverty of thought.

In a book concerned with so elusive a disease as pyorrhœa, the chapters on ætiology are those likely to be first examined. The authors put forward some new hypotheses of considerable interest. They divide the ætiological factors into two—primary or inaugurating, and secondary or non-inaugurating. These two co-exist in a kind of symbiosis; neither alone can cause pyorrhœa. The primary causes are, according to the authors, almost entirely mechanical; the secondary causes are of various kinds, of which bacterial infection is only one receiving comparatively brief mention. Among primary causes the authors lay great stress on traumatic occlusion as an important factor in the production of pyorrhœa. Since this view was first put forward by P. R. Stillman, this book represents an authoritative account of his theory. The conception depends on the hypothesis that there is a normal occlusion of standard type; Stillman, following E. H. Angle, assumes a rigid and fixed type which may be considered the same for all cases. The orthodontist concerned with the correction of irregularities of the teeth is familiar with this hypothesis, but its application to the ætiology of pyorrhœa is a newer development. Such a view does not appear to allow any margin for biological variation. Traumatic occlusion as an ætiological factor in pyorrhœa seems therefore somewhat speculative. Gross deviations from normal occlusion often exist in pyorrhœic mouths, though not invariably, and may undoubtedly predispose to pyorrhœa by favouring the impaction of food. But Stillman goes much beyond this and considers that very slight deviations from the hypothetical normal can cause pyorrhœa. According to his argument, the impact of mastication on teeth not correctly aligned injures the periodontal membrane to such an extent that bacterial infection supervenes. Stillman advises that pyorrhœa should be treated by correcting the mal-occlusion, and this by grinding the surfaces of the teeth, so as to produce the same series of inclined planes which exist in normal occlusion. No very convincing proofs are offered in support of the theory, but it is claimed that this form of treatment is highly successful. Since the usual routine of scaling and medication is also carried out, it might reasonably be argued that improvement results rather from the last-named treatment.

There may be a wholesome kernel of truth in this theory, but the husk of conjecture seems disproportionally large, and we doubt if the obscurity surrounding the causation of pyorrhœa is much lightened by the theory propounded in this book.

SURGERY.

Elements of Surgical Diagnosis. Sixth edition. By E. P. GOULD, M.D., F.R.C.S., Assistant Surgeon, Middlesex Hospital; Surgeon to the Bolingbroke Hospital. London: Cassell and Co. 1923. Pp. 739. 12*s*. 6*d*.

THIS is a new and revised edition of a well-known manual. It maintains the standard of former editions. It is eminently readable, has a good index, and is of a handy size. It is likely to remain popular with the student beginning the study of clinical surgery.

A Text-book of Minor Surgery. Fifth edition. By E. M. FOOTE, A.M., M.D., Visiting Surgeon, St. Joseph's Hospital; Consulting Surgeon, Randall's Island Hospitals and Schools; Clinical Professor of Surgery, New York Polyclinic Medical School and Hospital. London: D. Appleton and Co. 1923. Pp. 845. 35*s*.

IN the preface to this book Mr. Foote points out that in the past few years many new ideas in the diagnosis and treatment of disease have been announced and tested. Some of them, like the Wassermann test of the blood and the intravenous injection of preparations of arsenic in the treatment of syphilis, have affected all branches of medicine. Others are purely surgical in character, and it is these which have been incorporated in the fifth edition of this popular text-book. The excellence of illustrations alone would account for this popularity, and the

[1] See THE LANCET, 1921, ii., 1286; and also Oct. 20th, 1923, p. 893.

general get-up of the book is attractive. The section on blood transfusion needs to be rewritten entirely. Direct blood transfusion from one patient to another cannot be ranked as a minor surgical procedure, and, moreover, it is not justifiable, in view of the other simpler and more reliable methods. In most other respects the book is adequate for its purpose, which is to apply to the less serious everyday problems of surgical practice the new knowledge which the discoveries of the last 20 years have revealed.

Orthopædic Surgery. Seventh edition, thoroughly revised. By ROYAL WHITMAN, M.D., M.R.C.S., F.A.C.S., Surgeon to the Hospital for the Ruptured and Crippled, New York, &c. With 877 engravings. London: Henry Kimpton. 1924. Pp. xii. + 993. 42*s*.

Dr. Royal Whitman seems rightly determined to keep his treatise on Orthopædic Surgery up to date, for he has this year brought out a seventh edition. We noticed the sixth edition in THE LANCET (1919, ii., 19), and it is therefore only necessary now to note the changes which have been made in the new edition of this well-known work. In the first place, a few of the old illustrations have been omitted, but a number of new ones have been added, so that there are now 877 instead of 767. The additional figures are distributed throughout the book, but the principal changes are to be found in the chapters on the treatment of the deformities following upon anterior poliomyelitis in which operations of tendon transplantation are fully illustrated. The operation of arthrodesis of the foot and ankle, which is so well known under the author's name, is illustrated by some new photographs. The section on the treatment of fracture of the neck of the femur in adults is expanded and transferred, without reason assigned, to the chapter on Collateral Orthopædic Surgery, which takes the place occupied in the sixth edition by that on Military Orthopædic Surgery. Under this new chapter heading are included the treatment of fractures, operations of reconstruction or arthrodesis of the hip-joint, and some of the subjects which were formerly included in Military Orthopædics.

It is unnecessary to say much about a book which has become so well known, but we may hazard the opinion that this standard treatise has been brought so thoroughly up to date as to make it one of the most complete works on orthopædic surgery in the English language.

MCNALLY'S SANITARY HANDBOOK FOR INDIA.

Sixth edition. Rewritten by Major A. J. H. RUSSELL, M.A., M.D., Director of Public Health, Madras. Madras: Government Press. Pp. 472. R.4.8.

THE appearance of this well-known handbook, now revised and rewritten by Major Russell, affords useful evidence of advance in Indian sanitation, and its contents incidentally throw much light on British sanitary problems. The book is well written, readable, and we heartily commend its perusal to public health students in this and other countries desiring to view the chief problems of public sanitation from an Eastern standpoint.

The subjects are dealt with on similar lines to those followed in other text-books on public health. The information given under certain headings is elementary, as befits a book for consumption by Eastern students; but the main principles are clearly stated in the light of recent research, and we have failed to discover any error of fact or inference, except possibly the remarks on page 357 on the prevention of syphilis; here it is definitely stated that the inspection and treatment under the Contagious Diseases Acts in this country were definitely beneficial, and an opinion is expressed that regulation of prostitutes by law has been of obvious benefit in many European states. Both of these statements are highly debatable. The chapter on foods is very full, and includes a section giving a useful summary of our knowledge on accessory food substances. The importance of milk as a food is stressed, as in India it forms the sole animal food of Brahmins and some other castes. The Indian cow gives only about a quarter of the milk yielded by an English cow, the difference probably being due in the main to the deficiency and poor quality of the food supplied to the Indian cow. Raw milk is very rarely used in India; but that the apparently small amount of non-pulmonary tuberculosis in India is not thus explained is indicated by the statement on page 355 that in Madras Presidency it is very rare to find a tuberculous animal in a slaughter-house.

Parasitic diseases are very prevalent, especially ankylostomiasis. Special investigations in the last three or four years have shown that the infection-rate of the population varies from 99 per cent. in wet districts to between 30 and 40 per cent. in dry districts. It is almost universal in the coolie classes working on tea and coffee estates. We note a useful practical point in protecting coolies who will not wear boots against hookworm disease—viz., to make each man, before going to work, step into a vessel containing tar, so that the legs are coated with tar up to the knees. Apparently no instances of dermatitis have been recorded. The difficulty of protecting natives against this disease, even in cities, may be appreciated from the statement that in Madras city 20 tons of fæcal matter are estimated to be deposited daily in unauthorised places all over the town, and there allowed to remain. Ingenious use is made of ancient Indian teaching on various topics, as that Vishnu laid down a heavy fine for the pollution of drinking water. So in advising against immature marriages orthodox Indians are commended to observe the teaching of the seer who stated that a young man should not marry until he becomes a grihastha—that is, when he is about 24 years old.

The student or health officer who reads through this sanitary handbook will be impressed by its mastery of the essential principles of hygiene and public health, and by the excellent manner of presentation and discussion of each subject.

INDUSTRIAL OPHTHALMOLOGY.

L'hygiène de l'œil et le travail industriel. Problems of Industrial Illumination. Geneva: International Labour Office of the League of Nations. 1923. Pp. 160. Fr.3 (Swiss).

THE subjects dealt with in this useful brochure are as follows: The comparison of various sources of natural and artificial light, the minimum amount of light required for various employments, and the methods whereby it can be measured; ocular fatigue and its prophylaxis in different employments, its bearing on progressive myopia and on miners' nystagmus; industrial accidents due to deficient illumination; and lastly, a comparison of the regulations in force in different countries whose object is the minimising of ocular fatigue in industrial employment. This volume affords a useful summary of the present stage of knowledge and practice in all these subjects. Its value is enhanced by a bibliography containing a list of papers on these subjects by English, American, French, German, and Swiss writers.

CHEMISTRY.

Systematic Organic Chemistry. Modern Methods of Preparation and Estimation. By WILLIAM M. CUMMING, B.Sc., F.I.C., I. VANCE HOPPER, B.Sc., A.R.C.Sc.I., F.I.C.; and T. SHERLOCK WHEELER, B.Sc., A.R.C.Sc.I., A.I.C. London: Constable and Co., Ltd. 1923. Pp. 535. 25*s*.

A CRITICISM which may justly be levelled at the majority of books dealing with practical organic chemistry is that they have been written with a complete disregard for any considerations of practical importance in technical production. To meet this criticism the present authors, all of whom have had

both academic and industrial experience, have emphasised the necessity for considering the cost of the process and materials employed in the production of any given compound and have further introduced several manufacturing methods on a laboratory scale. They have, moreover, very wisely included a few operations involving the use of "oleum" in view of the industrial importance of this material.

The book opens with a useful chapter containing cautions with regard to the dangers of fire, poison, and accidents, and simple methods of dealing with the latter and other general advice to students; the second chapter deals at some length with a variety of apparatus which should be contained in a well-equipped laboratory. The second part of the book is divided into 30 chapters dealing with the actual preparation of specific compounds. The arrangement here adopted is novel and has much to recommend it; the general principle has been to divide the preparations and the headings of linking of carbon to carbon or hydrogen, sulphur, nitrogen, &c., each group being further systematically subdivided. Part III., composed of ten chapters, deals with quantitative measurements and estimations of groups, &c., while Part IV. is devoted to the preparation of a number of inorganic compounds required for the production of some of the organic compounds described in Part II. The authors have kept before them the intention of showing the student the close connexion between the lecture-room and the laboratory by accompanying each new reaction mentioned by a practical experiment to illustrate it, and have thus compiled a valuable book containing a large variety of organic preparations. The practical instructions are throughout clear and intelligible and references to original literature are repeatedly given. The book should be welcomed by teachers and students as a valuable addition to the practical text-books of organic chemistry.

Kurzes Lehrbuch der Chemie in Natur und Wissenschaft. By Prof. CARL OPPENHEIMER, Ph.D., M.D. Leipzig: Georg Thieme. 1923. Pp. ix. + 258 + 862. 29*s*.

THERE is nowadays hardly a branch of pure or applied science which does not, sooner or later, require the assistance of chemistry for the further elucidation of its problems, but unfortunately not all workers have chemical equipment requisite for further progress. It thus happens that there exists a large body of what may be described as chemical amateurs who, through force of circumstances, have acquired an interest in chemistry when it is too late to take up a complete study. For these a book such as Prof. Oppenheimer's may supply a want, since it attempts to compress into one volume the whole subject of chemistry in potted form. The introduction to general chemistry has been entrusted to Prof. Johann Matula, who deals ably with a wide range of subjects which include, among others, radio-activity, atomic structure, X ray spectra, colloids, valency, coördination numbers, thermodynamics, electro-chemistry, &c., the whole being treated in an up-to-date and readily intelligible manner. The second part, devoted to inorganic chemistry and covering 318 pages, is by Prof. Oppenheimer himself, and by skilful interspersion of a number of facts of practical or of physiological interest he has invested the subject with an interest not commonly encountered in a text-book of inorganic chemistry. The perusal of this section might well be recommended to those who would like to see inorganic chemistry cut out of the syllabus of medical students. The third part, on organic chemistry, is in some ways perhaps the least satisfactory of the three; the author has here attempted an almost impossible task, and the subject is treated in too sketchy a manner to serve the needs of students.

As a book of reference for biologists and others the work may be recommended on the whole, since it contains a wealth of up-to-date biochemical information which has not yet been incorporated in text-books on biochemistry. It is stated in the preface that the book is addressed to biologists, pharmacists, medical men, and agriculturists, as well as to technical chemists who wish to obtain information upon subjects in which they are not themselves specialists; but the author furthermore claims that it should be of use to any educated person wishing to obtain an insight into the workshop of the chemist. Whether it is possible to write a text-book appealing to such a heterogeneous type of audience remains doubtful, but there can be no doubt that the compilation is a very readable one.

New Inventions.

PORTABLE LIGHTING APPARATUS FOR OPHTHALMIC WORK.

SOME years ago, when commencing refraction work in schools scattered over the area of the county of Durham, I was forced to evolve a source of light that would be sufficient, reliable, and easily portable. Through the kindness of my friend, Dr. A. C. Norman, my attention was drawn to the desirability of using electric light supplied by an accumulator. I have gradually improved on the original, and the improved instrument is shown in the illustration. A polished

metal spring head-band, with an eight candle-power frosted lamp at its centre, is placed across the child's head from occiput to forehead. This lamp is connected by eight feet of flex, with a four-volt accumulator which stands on the floor near the child. A threaded screw placed near the lamp makes or breaks the contact. The accumulator will give sufficient output for 100 average refractions. The eight candle-power lamp gives ample light. If it be desired to use the light for direct examination of the fundus or for inspection of the cornea, the metal band is lifted off the head, and thus one is able to hold the light in any position. Apart from its portability, the light when on the head has the advantage of moving as the patient moves—a considerable advantage where a restless child is concerned. At the Durham County Hospital I use this same lamp for all purposes, and I obtain current by attaching the terminals to a pantostat. Oculists who may be called upon to see private patients in houses where the light is not too accessible and where the electric ophthalmoscope does not give sufficiently intense illumination, will find this portable apparatus of considerable service.

Messrs. F. Davidson and Co., 29, Great Portland-street, London, W. 1, supply sets to medical men.

ARTHUR T. PATERSON, M.D., F.R.C.S.E., D.P.H.
Durham.

THE LANCET.

LONDON: SATURDAY, DECEMBER 29, 1923.

GASTRIC ULCERATION.

THE thoughtful surgeon has an inveterate conviction of the ephemeral nature of his work. He knows that there can be no finality in surgery until surgery is banished from the treatment of disease. Eventually, injury alone will demand the exercise of surgical skill. This change is slowly but surely taking place before our eyes. Not many years ago the excision of tuberculous cervical glands was amongst the commonest of operations performed in a London hospital; now it is almost a rarity. Improved methods of combating disease have allowed us to dispense with the resort to the knife. Dr. A. R. NELIGAN reminds us in this issue how, in the treatment of liver abscess, open incision is giving place to aspiration. The same revolution has taken place in the treatment of tuberculous joints, whilst it seems fairly safe to predict the elimination of surgery in the treatment of malignant disease when the secrets of this scourge have been revealed to scientific investigation. It is therefore to be accredited as a virtue, when a surgeon is found to relinquish an established method for one he finds more effective in accomplishing his purpose. These truths of surgery are driven home by Sir BERKELEY MOYNIHAN in two recent lectures on the Treatment of Gastric and Duodenal Ulcer.[1] "A physician doomed to practise surgery," as the author calls himself, Sir BERKELEY MOYNIHAN has brought an essentially critical mind to bear upon problems arising out of an experience of no less than 718 cases of ulceration of the stomach and duodenum, where the diagnosis was established by actual inspection on the operating table. The conclusions to which he has been impelled by sheer weight of evidence demand our attention and enforce our belief.

In the diagnosis of a gastric ulcer the author relies upon two things, the history of the illness and the radiographic examination. There is only one way of establishing the existence of an ulcer beyond dispute. It is to see it. X rays will often render the ulcer visible before the withdrawal of the "curtain of the anterior abdominal wall." As to the symptoms, there is a rhythm which is characteristic of gastric ulcer, another significant of duodenal ulcer, and a sort of rhythm of activity alternating with apathy, with a period lasting over weeks or months. Punctuality in the onset of pain or relief from it is of diagnostic import. In this series of cases, duodenal ulcer was encountered much more often than gastric ulcer, and Sir BERKELEY MOYNIHAN maintains that the latter is seldom within 2 inches of the pylorus and so does not commonly give rise to pyloric stenosis. Narrowing in this region is the result of extension of duodenal ulceration, a process which may go beyond the pylorus into the stomach itself, where a malignant change may supervene. It is possible at this stage to come to some conclusion of value concerning that difficult decision as to the efficacy of medical methods of treatment at our disposal. Medical treatment rarely leads to sound healing and demands such enduring care on the part of both patient and physician, that it becomes too irksome as a practical measure for those who must take part in the ordinary intercourse of the world. Sir BERKELEY MOYNIHAN, in cases where the only possible operation was a jejunostomy, has been able to watch the alteration in X ray appearances from time to time. He finds that healing, as evidenced by change of shadow outline, is always a matter of many months and in some cases of years. Neither is the disappearance of the niche, as seen by barium meals, always proof of healing. This fallacy was demonstrated by E. HOLLANDER.[2] Many gastric ulcers resemble those intractable leg ulcers which repeatedly break down and persist until the end of life. It is without exaggeration to say that the medical mortality from perforation and hæmorrhage is vastly greater than that incidental to surgery, which in a very high percentage of patients leads to a permanent cure. In Sir BERKELEY MOYNIHAN'S large personal series, there has been no operative death since 1912. There is one other argument brought forward to support the surgical attitude in the treatment of gastric ulcer, the belief that cancer arises in the simpler lesion. This does not carry the weight of the considerations set forth above, for a very competent group of pathologists deny the frequency of malignant degeneration on firm histological grounds. Cancer, according to them, does sometimes originate in the margin of an ulcer, but quite rarely.

However this may be, surgery seems definitely to have established itself as the only effective treatment for gastric ulcer. What should be the method of surgical attack is an almost equally vital question to decide. Opinion is not quite unanimous yet on this point. Sir BERKELEY MOYNIHAN has tried many procedures. Generally speaking, he has concluded that gastro-jejunostomy is most widely applicable and effective in duodenal ulceration, whilst excision of the pyloric segment of the stomach with lateral implantation into the jejunum by the "no-loop" method, devised by himself, is almost ideal in the treatment of the gastric lesion.

[1] Gastric and Duodenal Ulcer. By Sir Berkeley Moynihan. Bristol: John Wright and Sons, Ltd. 1923. Pp. 48. 2*s.* 6*d.*

INSANITY ON ARRAIGNMENT.

OF the minor points arising out of the recent report of the Committee which has been considering the legal effects of insanity in criminal trials there was one—not covered by our recent summary—which has not had to wait long for illustration. A young man was found guilty of the murder of a woman in a taxi-cab in the Brompton-road. There had been a preliminary question of his fitness to plead to the charge. Dr. W. N. EAST, senior medical officer of Brixton Prison, expressed the opinion that the man was unfit to take his trial. Mr. Justice AVORY, however, with some remarks upon the divergence between medical and legal views, instructed the jury that, if the man was able (as he seemed to be) to follow what was going on in court, they could say that he was fit to plead. The jury found him fit to plead, and the case proceeded, with the result already stated. We alluded to this case more in detail under the heading of Medicine and the Law, and need only note here that the divergence of opinion to which the judge referred was merely the notorious difference between legal and medical conceptions of insanity. Had the jury found the man unfit to plead, his subsequent treatment would have occasioned a further divergence of opinion which is worth examination.

[2] Jour. Amer. Med. Assoc., 1923, lxxx., 29.

Before the stage is properly set for the drama of a criminal trial there are three important preliminaries. The first is the arraignment of the prisoner—i.e., the bringing of him *ad rationem*, to a reckoning, by reading the indictment to him. The second is his plea, which, with certain technical exceptions, is either "Guilty," or "Not guilty." The third, if he pleads "Not guilty," is the joining of issue between him and our Lord the King, that issue which the jury is summoned to try. But if the prisoner is insane, if the arraignment means nothing to him, and if he cannot make his plea to it, there is a deadlock. There may therefore be a preliminary issue as to his sanity. Upon his arraignment either the prosecution or the defence is allowed to raise the question of the prisoner's fitness to plead. Then if he is found insane by a jury impanelled for the purpose, so that he cannot be tried upon the indictment, the court must direct this finding to be recorded and the accused to be kept in custody till His Majesty's pleasure be known. This procedure is ordained by Section 2 of the Criminal Lunatics Act of 1800, an Act passed after the trial of HADFIELD for shooting at King GEORGE III. in Drury Lane Theatre. The point the jury has to decide is whether the accused is insane at the time of the arraignment, not at any other time. The test laid down by judges in the past is whether he is of sufficient intellect to comprehend the course of the proceedings so as to make a proper defence, to challenge a juror to whom he might wish to object, and to understand the details of the evidence. The result of a finding of insanity on arraignment is that the prisoner, who may be entirely innocent of the crime, is forthwith treated as if he had been found guilty but insane, and is sent to a criminal lunatic asylum. It is at this point that the medical and the legal views seriously diverge. The Medico-Psychological Association, emphasising the injustice to a possibly innocent man, suggests that in these cases a plea of "Not guilty" should be entered, and that the trial should proceed, arrangements being made for representation of the interests of the accused. The British Medical Association recommends that persons found unfit to plead should have a right under proper conditions to apply to a High Court judge for an order that the issue of fitness to plead should be re-tried. To this the report of the recent Committee replies that, if a man is insane, it is a burlesque to proceed with his trial: that the standing orders of the Prison Commissioners (which recommend that a prisoner be left to stand his trial unless there are strong reasons to the contrary) represent the present practice and are satisfactory; that a prisoner should not be found unfit to plead except upon the evidence of at least two doctors; and that from a finding of insanity upon arraignment there should be no appeal.

We are left, therefore, in the improper and indefensible position that in these cases a possibly innocent man—or rather a man deemed innocent by law because not yet found guilty—is put away, perhaps for life, in a criminal lunatic asylum. If his relatives complain, the legal answer seems to be that usually in these cases, if the man recovers and is tried, the result is a verdict of "Guilty but insane." This is an odd perversion of the doctrine of the presumption of innocence. It is perhaps worth adding that, as the trial proceeded in the taxi-cab case, a considerable volume of evidence as to insanity was adduced without effect. The same remark might be made of another case also tried lately at the Old Bailey, in which an unhappy woman was found guilty of murdering her four-months-old illegitimate child by strangling it, and afterwards throwing the body into a brook. It was proved that her father and aunt had been certified lunatics, that an uncle had also been confined in an asylum, and that the prisoner herself was mentally deficient. She was not insane, however, in the eyes of the law. This latter case was labelled in the press as one of infanticide. In a popular sense it was; technically it was not. It may be remembered that under the Act of 1922, which created the new legal offence of infanticide, a more lenient punishment can be awarded when a woman causes the death of her newly-born child, "but at the time of the act she had not fully recovered from the effect of giving birth to such child, and by reason thereof the balance of her mind was then disturbed." The fact that such an Act should have been necessary is in itself a condemnation of the legal treatment of insanity in criminal trials.

STRAINS OF THE DIPHTHERIA BACILLUS.

SUBDIVISION within the species into varying numbers of serological strains is being gradually extended to embrace a very large number of pathogenic organisms. Sometimes the matter is of great practical importance in treatment, since sera potent against one individual may be useless against another. This holds particularly with the pneumococci, but is of much less importance with a toxin-producing organism, such as tetanus, which seems to produce the same toxin, neutralisable by one and the same antitoxin, whatever be its serological type. The matter stands similarly with regard to another toxin-producing organism, the diphtheria bacillus. It has comparatively recently become recognised that this organism, too, can be split into groups on the grounds of their agglutinability with single sera prepared from a number of single strains. Dr. W. M. SCOTT[1] has recently investigated this now well-established fact, with special reference to the status of those organisms which, though closely allied to the diphtheria bacillus, have been excluded from the pale by most human bacteriologists on the ground that they do not produce toxin. He has also studied the question of the special activity of one or other of these serological strains in epidemics. Dr. SCOTT has compiled eight agglutinating groups which include 184 of his total of 265 strains, leaving 81 strains still unidentified. This well exemplifies the complexity of such a grouping, since to include the whole of these strains under serological headings would necessitate the formation of a very unwieldy number of groups.

The most interesting fact which emerges from this classification is that the majority of bacilli obtained from actual cases of the disease fall into one set of groups, whilst in the "carriers and contacts" there is a marked shift of the distribution into another set, which latter occur only in a small minority of actual cases of the disease. Likewise the percentage of unidentified strains, which is only 13 in the acute cases, rises to 30 in convalescents, and 51 in the contacts and carriers. These facts can only mean, so it seems to us if we accept the usual carrier conception, that the serological type changes in convalescence or in transference to another host. It would be interesting to have included an analysis of the distribution of such bacilli in normal persons who have not been in special contact with diphtheria cases. It must, if this interpretation be true, also follow that where such a carrier infects a fresh subject the organism must revert to one of the serological groups which predominate in the acute disease. This matter is one of great importance in any consideration of the rôle of the carrier in diphtheria. Either these extraordinary mutations occur, or the importance of the carrier has been misconceived, or the observations are incorrect; and we have no reason for believing that the last alterna-

[1] Reports on Public Health and Medical Subjects, No. 22, Ministry of Health. H.M. Stationery Office. 2*s*.

tive is the correct one. Dr. SCOTT includes within his group non-toxin-producing strains which cannot be excluded by ordinary morphological and cultural characters. If the agglutination characters of the bacilli are as labile as the forementioned considerations would suggest this does not seem quite justifiable. After reading his paper, and in view of Hartley's showing that all pathogenic diphtheria bacilli produce the same kind of toxin, we are more satisfied than ever that the only satisfactory final criterion of the diphtheria bacillus, not for clinical diagnosis but for practical bacteriological differentiation, is its ability to produce toxin.

Annotations.

"Ne quid nimis."

ALCOHOL INJECTIONS FOR NEURALGIA.

AT a recent meeting of the Section of Otology of the Royal Society of Medicine Mr. Arthur H. Cheatle showed three patients who had sustained damage to the ear following the injection of absolute alcohol through the face for the cure of neuralgia. In two there was injury to the middle ear and in one to the auditory nerve. The first was a man aged 71, who had severe deafness and some discharge from the left ear immediately after the injection a year previously. He did not have pain, giddiness, or tinnitus, but there was temporary paralysis of the facial nerve. The second case was that of a man aged 72, who, following a similar injection two years previously, had severe deafness, tinnitus, and a slight discharge. There was no giddiness, pain, or facial paralysis. The neuralgia was cured. No doubt in this case the alcohol entered the Eustachian tube and reached the middle ear. Both these cases had a general anæsthetic for the operation, and Mr. Cheatle pointed out that if it were done under local anæsthesia, according to the custom of Dr. Wilfred Harris, the patient could give warning of anything wrong. The third case was that of a woman aged 22, who had complete deafness on the left side following the spirit injection under a general anæsthetic nine months previously. There was also immediate giddiness and paralysis of the sixth and seventh nerves. She had been very ill in bed for five months, and her neuralgia was not cured. Subsequently, the Gasserian ganglion was removed; this cured the pain, but entailed the loss of an eye. Apparently the spirit had reached the subarachnoid space and directly injured the sixth, seventh, and eighth nerves. In all the three cases the injection was carried out by experts. At the same meeting Mr. T. B. Layton described a case in which the injury produced on a middle-aged man by injection of alcohol for the same purpose was much more severe. He had lost the left eye, and on the right he had corneal ulceration; he spoke in a high falsetto voice, and he was very deaf. The left side of his face was paralysed. In all he had had ten injections, most of them in the Far East. Mr. Sydney Scott, the president of the section, said he had heard of such cases but had not seen any. He had used absolute alcohol for destroying the internal ear. As the spirit spread rapidly, it was necessary to use only a minimal quantity so that none was allowed to reach the middle ear. The measure was only carried out by him in extreme necessity. Sir William Milligan said he had not much experience of these injections, but he knew of cases in which they had done irreparable damage, some in which it had been necessary to remove an eye. Relief in some cases he knew of lasted from 9 to 18 months, but others gained no relief by it at all.

The avoidance of accidents when alcohol is injected for the cure of trigeminal neuralgia deserves close attention. Pricking the Eustachian tube should be a well-known danger to those accustomed to giving such injections. Under local novocaine anæsthesia the patient will always complain of a pain deeply situated in the ear if the needle reaches the Eustachian tube, and when this occurs the needle should be withdrawn about an inch and then pushed slightly forward. Novocaine probably does no permanent injury if injected into the Eustachian tube, and if the rule be scrupulously followed not to inject spirit until anæsthesia results from the preliminary novocaine, no harm will come. Thus to secure safety under general anæsthesia, novocaine alone should be injected in one spot only, and the patient allowed to come round sufficiently for testing the two sides of the face with a pin, while the injecting needle is left in situ. If the desired anæsthesia is found to have resulted, then the alcohol syringe is fitted on and the injection completed, a further whiff of general anæsthetic being given if thought desirable. If no anæsthesia has resulted from the novocaine, then no spirit should be injected, but a fresh search made for the nerve. Usually it is unnecessary to give much further anæsthetic for this. The practice of making a rapid injection in the direction of the foramen ovale under a general anæsthetic, and assuming that by doing so one has injected the third division of the trigeminal nerve, is to be rejected. The procedure is not by any means so easy that it can be done without care, but the nerve is there to be found if the operation be conducted with patience and deliberation, and there should be practically never any failure. In the third case described by Mr. Cheatle the catastrophe appears to have happened after the needle had penetrated the foramen ovale in the endeavour to inject the Gasserian ganglion under general anæsthesia, the sudden injection of a quantity of alcohol into the subarachnoid space causing widespread and permanent paralysis of cranial nerves. Had the injection been done a few drops at a time, after letting the patient come round partially from the anæsthetic, the operator would have been warned of danger by the appearance of nystagmus, vertigo, and commencing facial paresis. Then with the cessation of the injection the symptoms would almost certainly have passed off in a few minutes or an hour at most. The duration of relief from the neuralgia is, we would suggest, better than Sir William Milligan suggests. In an article on the technique of these injections contributed to our columns [1] last year Dr. Wilfred Harris states that freedom from the neuralgia may practically be guaranteed for 12 months if the nerve has been properly hit, and in the majority of his cases the immunity from pain was much longer, ranging up to 13 years in one case. Four and five years was a common period for the immunity to last in his experience. In the Gasserian injections there is no reason why permanent relief should not be expected, the anæsthesia obtained being as complete as that after Gasserectomy.

MEDICAL MILITARY PREPAREDNESS.

MILITARY medicine will never flourish unless the medical student becomes interested in it during his years of training. In the November issue of the *Military Surgeon*, the first number entirely edited by Major E. E. Hume, U.S.M.C., an active service officer, the best way of training the medical student to understand the work of the military medical officer is discussed by Lieut.-Colonel H. H. Rutherford. He thinks this can be done, in spite of the already crowded time-table, if he can get specially good instructors, a very high-class text-book, and is allowed to pick only high-grade students for the course, which will occupy 240 hours in the early years and a spell in camp at the end of the last year. In the same issue Major L. H. Bauer, Commandant of the School of Aviation Medicine, sketches the training given to the reserve medical officers of the U.S. Air Service. They are divided into three classes—flight-surgeons, examiners, and specialists. These all belong to the outside profession; they are busy men, and while they must

[1] THE LANCET, 1922, ii., 123.

be instructed, it is most important that their time shall not be wasted; accordingly the first class are given two correspondence courses through two winters, with a short basic course of practical work in the summer. The first winter's course deals with the eye and ear, the heart, and neuropsychiatry; the second course develops these subjects further and takes the student over Air Service administration, all this by correspondence, but everything is gone over again, practically, in the summer basic course. It is felt that the reserve officer will now be a better practitioner than before, and, if he passes the examination after the first year, he will be allowed to make the physical examination for flying, and having passed after the second course will be rated flight-surgeon. Selected officers will have a six weeks' training at the Aviation School. Those who succeed will be qualified as examiners. The third class are research workers, physiologists, eye specialists, and the like, who will be called to act as instructors in the school. It is hoped that "by the time of another emergency" America would have flight-surgeons, physical examining units, and specialists ready to step in and aid in the rapid expansion of the Air Service. In a third article Colonel G. M. Blech, one of the founders of the Medical Officers' Reserve Corps, explains to young members, already highly educated doctors, why they should interest themselves in learning something of tactics, how much more useful that knowledge will make them in battle, and how easily the necessary knowledge may be acquired. The whole number is full of the need for preparedness.

INTERNATIONAL CONGRESS ON INDUSTRIAL HEALTH.

A GROUP of Swiss medical men interested in industrial health questions met at Berne last October and constituted themselves as the Swiss Organising Committee for an International Congress on Industrial Health to be held at Geneva from July 18th–20th, 1924. The committee consists of Prof. W. von Gonzenbach (Zurich), Prof. W. Silberschmidt (Zurich), Prof. H. Zangger (Zurich), Dr. A. Rossi (Lugano), Dr. H. Carrière, Director of the Public Health Service, and Prof. H. Cristiani (Geneva), the last named being chairman. This first congress will deal with the following questions: industrial lighting and eyestrain; impure air in factories; the value of fatigue tests. The committee has asked prominent men of science who have given special attention to these questions to draw up reports on them, and three such reports will be presented for each question. The office of the committee is at the Institut d'Hygiène of the University of Geneva, and all persons wishing to take part in the congress should communicate with the committee at that address, from which further information may be obtained.

ACTINOMYCOSIS OF THE HEAD AND NECK.

IN a recent communication to the Pacific Northwest Medical Association, Dr. Gordon B. New and Dr. Fred A. Figi,[1] of the Section on Laryngology, Oral and Plastic Surgery of the Mayo Clinic, illustrated the frequency with which actinomycosis of the head and neck escapes recognition. They gave the following statistics. During the decennium 1913–22 inclusive 157 patients with actinomycosis were examined at the Mayo Clinic. In 107, or 68·1 per cent., the disease involved the head and neck, but only seven of these patients were being treated for actinomycosis at the time of their admission to the clinic. The disease is much commoner in males than in females, 98 of the 107 cases being in males. The ages ranged from 9 to 66 years, but the majority of the patients were in early adult life. As regards the method of infection, 45 out of 80 patients, or 56·1 per cent. from whom information could be obtained, stated that they had not come into contact with the disease in animals. The remaining 35, or 43·7 per cent., had been more or less closely associated with the disease in animals before they developed symptoms themselves. In no case was there evidence of direct transmission from one person to another. The clinical picture of actinomycosis of the head and neck varies according to the virulence of the infection and the amount of secondary infection. The commonest symptoms are stiffness in the region involved, pain, and swelling. The jaw may begin to tighten and even become completely ankylosed. Pain is sometimes severe, or may be completely absent until the mass breaks down. In some cases dysphagia may be an early symptom, especially if the base of the tongue or anterior cervical region is involved. Sore throat, stiffness of the neck, and earache are occasional symptoms. The activity of the process varies from a slow indolent condition, which takes months or years to reach its full development, to a fulminating one of a few weeks' duration. The commonest type is that of an indurated mass which breaks down forming multiple superficial abscesses. The disease is liable to be mistaken, as was illustrated in the writers' series, for malignant growth, tuberculous adenitis, osteomyelitis of the lower jaw, thyroglossal duct sinus, subperiosteal abscess, and tuberculous thyroiditis. The most important factor in the treatment is early diagnosis. In advanced cases intracranial extension may develop or the chest may become involved. In addition to iodides, which are almost specific and should be used in progressively increasing doses, radium has proved beneficial by causing a breaking down of the granulomatous masses and clearing up the induration. Surgical treatment consists in opening up widely all pockets, packing them with iodoform gauze, and swabbing the wounds with iodine. Of 85 cases which could be traced by the writers, 60, or 70 per cent., were well five years or less after their discharge, 7 were dead, and 18 were still under treatment.

[1] Surgery, Gynecology, and Obstetrics, November, 1923.

OPIUM AND DYSPNŒA.

THE term dyspnœa is one which is difficult to define exactly, but it may be taken to mean a condition in which the normal sequence, rhythm, and character of the acts of respiration are disturbed, whether subjectively or objectively. In the healthy subject, the normal control of respiration lies in the activity of the respiratory centre of the medulla. This centre is regarded as being capable of automatic activity and of sending rhythmic efferent impulses to the muscles that perform the movements of respiration. The activity of the centre is known to be affected by four influences which are independent of volition—namely, (1) the pressure of CO_2 in the blood supplied to the centre, (2) the H-ion concentration of the blood supplied to the centre, (3) the pressure of oxygen in the blood supplied to the centre, and (4) the afferent impulses reaching the centre, which may come from the higher centres, as shown in the effects of volition and emotion. Many investigators have worked on the problems presented by these several factors, and their results show that disturbances of the respiratory mechanism can result from (1) alteration in the CO_2-content of the blood supplied to the respiratory centre—increase in this content causes increased breathing, with acidæmia and raised CO_2 pressure; (2) alteration in the fixed acids in the blood, so that increase in the acids causes increased breathing, with acidæmia and lowered CO_2 pressure; and (3) alteration in the oxygen in the blood supplied to the centre, so that deficiency causes increased breathing, with alkalæmia and lowered CO_2 pressure. Oxygen-lack causes mainly increase in the frequency of breathing, while increased CO_2 pressure and increased fixed acids cause mainly increase in the depth of breathing.

Among the investigations reported on clinical cases of cardiac dyspnœa, each of these three types of chemical change has been found, plus

dyspnœa due simply to mechanical causes, as œdema of the lungs. The whole subject was discussed by the Royal Society of Medicine on broad lines at a recent meeting of the Section of Therapeutics when Dr. Claude Wilson read a paper which we published last week. Dr. Wilson divides cardiac dyspnœa clinically into two distinct types: (*a*) Ordinary breathlessness as an immediate consequence of exertion, and (*b*) paroxysmal dyspnœa, subdivided into Cheyne-Stokes breathing and cardiac asthma, for the treatment of which latter type he recommends the use of opium. The indications for such treatment would appear to be borne out on physiological grounds by the data collected by Prof. F. R. Fraser, who introduced the subject in a comprehensive review of recent research in this field. Prof. Fraser quotes the investigations of many workers on differing clinical types of cardiac dyspnœa, and comes to the conclusion that, if the present explanation of the causes of dyspnœa is correct, then any treatment that is to affect the fundamental cause of the dyspnœa—that is to say, oxygen deficiency through stasis—must be directed towards improving the efficiency of the circulation. Administration of oxygen can only be useful when the arterial blood is deficient in oxygen. The rapid shallow breathing of cardiac dyspnœa is peculiarly ineffective in correcting the disturbance, as it permits of stasis in the bases of the lungs and deprives the respiratory movements of much of their value in aiding the circulation. The administration of morphia causes slowing of the respiration, with the result that, clinically, the circulation of the patient would seem to be stimulated and his general condition improved. Thus morphia apparently does more than simply check a symptom. In the treatment of paroxysmal dyspnœa with progressing œdema of the lungs, not only do the respiratory disturbance and distress diminish, but the œdema of the lungs may clear. If such paroxysms, with or without the development of œdema, are due to an exacerbation of the failure of the left ventricle, as seems most likely, then the essential cause of the dyspnœa will be the same as in simple cardiac dyspnœa—namely, oxygen-lack at the centre. This will result in lowering of the carbon dioxide pressure and alkalæmia, and since the dyspnœa continues, the centre must be acting at a lowered threshold to H-ion concentration. This is the conception of Haldane in the condition of oxygen-lack in healthy people. Morphia depresses the centre, so that it reacts at a raised threshold. The effect of treating cases of dyspnœa with morphia would therefore be to raise the threshold so that the centre reacts only to a higher H-ion concentration than before. This would have the effect of restoring the carbon dioxide pressure throughout the body and in the medulla to a more normal level. Prof. Fraser emphasised the need of carefully ascertained facts in the study of this condition, and concluded a valuable paper by laying down an important axiom. The use of drugs in order directly to affect the dyspnœa with benefit to the patient cannot be clearly understood until the conditions of the centre and the afferent impulses, and the actions of such drugs on the centre and on the afferent impulses, are elucidated.

POST-GRADUATE MEDICAL EDUCATION.

FOR some years past the need for greater facilities for post-graduate instruction has been recognised in this country, and various attempts have been made to remedy the defect. The Fellowship of Medicine is doing excellent work in providing access to the clinical teaching of the various London hospitals and in arranging a number of lectures for post-graduate students, while the West London and the Prince of Wales's hospitals are devoting all their clinical material to post-graduate teaching. But while these efforts do fill a very definite place, they are chiefly of use for the general practitioner, or for those who have only a very limited time at their disposal. Training for the specialist is still inadequate. E. P. Lyon [1] gives an interesting account of the way in which the problem is being solved in the University of Minnesota. The chairman of a committee on post-graduate instruction investigated how men became surgeons, urologists, oculists, and so forth.

"He found, taking the good ones, that the chief method that has been used in the past and that is in use now is that they should serve as assistants in a good clinic for two, three, or more years. The doctor calls his helpers assistants; but from the young men's standpoint, they serve their assistantship for the purpose of becoming efficient in the speciality. Now our idea is that those young men be regarded as students and not as hired men. If you go to the Mayo Clinic or the University Hospital you will see young men working there. They will look to you like assistants, and they are assistants; but we take a different view regarding them. We say they are not the servants of the clinic, but primarily students. We call them Fellows. As soon as you make that slight transition in regard to your assistant, you have made a great difference in your attitude toward him and in his attitude toward his work. You lay out a man's programme not with reference, primarily, to how he can best help you, nor how he can best contribute to the efficiency of the hospital or clinic, but how you can best help him . . . You would hesitate to send an assistant perhaps to the anatomical or pathological laboratory, for three or six months and pay his salary; but we do not have any hesitancy in sending these men, if that is what they need."

Here we notice a vital difference between the method used in the University of Minnesota and that in vogue in any of the British medical schools, and the Mayo scheme might be worthy of the consideration of those responsible for post-graduate instruction on this side of the Atlantic.

OZÆNA AND DIPHTHERIA.

Dr. R. Kawano,[2] of the Vienna State Institute for Serum Therapy, alludes to the investigations of Beck and Brodt, who in a paper read before the second annual meeting of German oto-rhino-laryngologists, stated that in 32 out of 36 cases of ozæna they found diphtheria bacilli present, and in only five out of 30 cases of non-fœtid atrophic rhinitis. According to these investigators, the fœtor in ozæna apparently depended on the presence or absence of diphtheria bacilli; in other words, it was absent when the examination for diphtheria bacilli was negative. They also found that patients with ozæna had a relatively high antitoxin content in their blood as compared with patients suffering from atrophic rhinitis, and regarded this as a sign that the ozæna patient had had at some time an attack of diphtheria. On the other hand, Dr. Kawano, on examination of 65 cases of ozæna, found bacilli of the diphtheria group present in the nasal discharge only eight times, or in 12 per cent. Moreover, in not a single case were they true virulent or non-virulent diphtheria bacilli, but only pseudo-diphtheria bacilli. Even these pseudo-diphtheria bacilli were not absolutely identical with one another, but consisted of different representatives of the group, as was proved by experiments on animals and agglutination reactions. The supposed relationship of the fœtor of ozæna to pseudo-diphtheria bacilli was therefore open to doubt. The high antitoxin content of the blood in ozæna patients found by Beck and Brodt is regarded by Dr. Kawano merely as a coincidence. There are cases of ozæna with a low antitoxin content, as well as cases with a high antitoxin index, just as occurs in normal persons. There are, therefore, no grounds for supposing that ozæna patients must necessarily have had an attack of frank or latent diphtheria. Dr. Kawano also found that the changes produced by the action of diphtheria toxin on the mucous membrane of the nose and turbinate bones differed histologically from those caused in the rabbit's nose by the production of experimental ozæna, which bears a considerable resemblance to the lesions of human ozæna.

[1] Papers from the Mayo Foundation, vol. ii., 1921–1922.
[2] Wiener klinische Wochenschrift, Oct. 18th, 1923.

VACCINATION BY THE MOUTH.

THE idea of attempting to immunise animals by the buccal route is no new one. Pasteur essayed it in his experiments on anthrax in 1880, but the results obtained were not encouraging. In the interval various rather sporadic attempts at vaccination by this route have been forthcoming, but interest in the matter languished until stimulated again by Besredka's work on typhoidal infections, which we have already noticed in previous issues. A critical survey of the present position of the subject is given by Prof. A. Calmette in the October issue of the *Annales* of the Pasteur Institute, and is worthy of being consulted by all who are interested in this matter. After surveying the physiology of the intestine in reference to its microbic flora, he passes to a consideration of the different conditions in which oral vaccination has been claimed to be useful. These include infections so widely differing as the typhoids, dysenteries, cholera, Malta fever, tuberculosis, diphtheria, plague, and septic infections. The chief interest, however, centres around the use of oral vaccination in typhoid and dysentery. For the former the method has been tried in France in two human epidemics. In each of these cases the subsequent incidence of the disease in those who were vaccinated by the mouth compared very favourably with the incidence in those vaccinated in the ordinary way by the T.A.B. vaccine; in neither case, however, were the conditions sufficiently well controlled to enable exact deductions to be made. The possibilities of this method of immunisation has perhaps even greater interest in connexion with bacillary dysentery, in which disease attempts to inoculate on the lines familiar in typhoid have notably failed, on account of the great toxicity of killed cultures of these organisms and the violent reactions which their injection provokes; hence, if the oral route were found satisfactory it would be a very great gain indeed. Experiments on animals have been encouraging, and the human experiments of Nicolle and Conseil, which we have previously noted, are promising, but the method has yet to be tested on a large scale. Calmette concludes that the method is only, as yet, in the early days of its trial, and, especially with regard to the typhoidal diseases, he utters a warning against the possibility of the hurried abandonment of current methods whose efficiency has been proved, in favour of others, easier of application, but as yet of doubtful value.

INCUNABULA.

WHAT are incunabula? The original meaning of the word is swaddling clothes, then it came to mean "origins" or the early stages of anything, and finally it was applied by the Germans with the particular meaning of early printed books. "Incunabula Medica: A Study of the Earliest Printed Medical Books, 1467–1480,"[1] takes its title from the presidential address delivered by Osler on the occasion of his election for the second time as President of the Bibliographical Society in 1914. The address as printed is not the address as delivered by Osler, but has been expanded by the addition of some bibliographical details obtained by Mr. Scholderer, assisted by Dr. Francis and Dr. Malloch. The book also contains a list of medical works printed before 1481, edited by Mr. Scholderer, two indices, the one of authors and books and the other of printers and places, together with 16 facsimile plates of pages from early printed books. There is a learned and charming preface from the pen of "A. W. P.," who, we imagine, must be Mr. A. W. Pollard, giving an account of Osler's connexion with the Bibliographical Society; he served as President for seven years. Mr. Pollard is Keeper of the Printed Books in the British Museum and Hon. Secretary of the Bibliographical Society, and we gather from the preface that he is responsible for the shaping of Osler's address for printing. Issued under such auspices it is no wonder that the book as a whole is a real treasure for book-lovers, while the format, the printing, and the plates are worthy of the high standard of the Oxford University Press. Osler's address is the very man himself, learned, cultured, and written both as regards matter and manner in a way which would have delighted Richard of Bury, the famous book-loving Bishop of Durham. It deals with 67 medical writers, whereas Mr. Scholderer's list contains some 218 entries, although these, of course, are not all separate authors. Osler's conclusion is that "one cannot say that, for the first twenty-five years of its existence, printing did much, if anything, to free the profession from the shackles of mediævalism. Not until the revival of Greek studies did men get inspiration from the true masters of science."

Every medical man interested in medical history should read this book and every book-lover too, while as a cognate study we recommend a little book, not too well known, called the "Wanderings and Homes of Manuscripts," by that finished scholar and humanist, Dr. M. R. James, Provost of Eton. Books are not everything, but good books represent the ordered arrangement of the experience and mental output of many generations, and to use the words of the above-mentioned Richard of Bury in his allocution to books, they "are the wells of living waters, which father Abraham first digged, Isaac digged again, and which the Philistines strive to fill up."

[1] By the late Sir William Osler, Bart., M.D., F.R.S., Regius Professor of Medicine, Oxford. Printed for the Bibliographical Society at the Oxford University Press. 1923. With 16 facsimile plates. Pp. 137.

THE PANDEMIC OF INFLUENZA IN INDIA IN 1918.

Dr. E. S. Phipson,[1] health officer of Simla, devotes his London M.D. thesis to the consideration of the pandemic of influenza in India, with special reference to the city of Bombay, of which he was recently the assistant health officer. After a review of past epidemics he describes the genesis of the 1918 outbreak. Apart from influenza the latter half of 1918 was unusually free from epidemic disease; the incidence of plague was the mildest for 20 years, and the failure of the monsoon had caused a subnormal incidence of malaria. On the other hand, the stock of food was relatively low, the rainfall was subnormal. Prices were everywhere abnormally high, and the war had greatly depleted the medical staff, which at the best of times was inadequate for the enormous population. The first phase of the epidemic occurred in June and lasted barely four weeks, during which time the epidemic cost Bombay over sixteen hundred lives, at least a million working days, and an incalculable amount of discomfort, expense, and inconvenience. The second phase began after about an interval of two months on Sept. 10th, reached its height on Oct. 6th, and subsided in the second week of November. It differed from the first phase by the far greater frequency of complications. Broncho-pneumonia, which tended to assume a markedly toxæmic type, was responsible for the majority of deaths, and was as fatal to strong adults as to young children, and the old and debilitated. The mortality from influenza in Bombay City during the second phase, though very much less than that in India as a whole or in certain provinces such as the Central Provinces and Delhi, was 14,678, which was equivalent to 13·3 per 1000 of the estimated population or considerably more than three times the mortality occurring in the urban populations of England and Wales during the three epidemic waves of 1918–19. The combined mortality for all the hospitals in Bombay City was 34·21 per cent., but as only the worst cases and members of the poorest classes were admitted, this figure could not be regarded as an index of the case mortality in the general population; 36·2 per cent. of the deaths occurred among persons aged 20 to 40, the highest mortality—61·6 per 1000 of the community—being among low caste Hindus and the lowest mortality—8·3 per 1000—among Europeans.

[1] The Indian Medical Gazette, November, 1923.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LI.—TREATMENT OF CHRONIC COLITIS.

A WRITER on chronic colitis is in the outset dismayed by the fundamental difficulty of definition. The term "colitis" can be employed when unequivocal evidence can be advanced of ulceration of the large bowel as in, inter alia, dysentery, tuberculosis, malignant disease, and infection by the *B. coli* and other pyogenic organisms in the condition known as ulcerative colitis. But most cases of what is generally known as chronic colitis cannot be attributed to any specific infection, whilst post-mortem evidence of any pathological condition of the bowel is lacking. To the last criticism one can only reply that the inflammation is of a catarrhal character.

Hypersecretion of Mucus.

In addition to the specific infections and malignant disease already mentioned, there are mechanical causes for irritation which alter the lumen of the bowel, such as ptoses, kinks, strictures, adhesions, and the pressure of external tumours which may lead to hypersecretion of mucus. To these must be added such irritants as scybala in chronic constipation, as well as the means adopted for relief, whether purgatives or ill-advised and unsuitable douches. Other familiar possibilities are intestinal parasites, subacute infections of the alimentary canal, and sepsis from teeth, nasal sinuses, tonsils, or pelvic viscera. Uric acid and other irritants which are excreted through the intestinal mucous membrane have similarly been blamed in this connexion.

When the well-recognised causes have been excluded there remain as a distinct group cases of primary colitis. To such a group a large variety of names has been appended, among which may be mentioned mucous colitis, muco-membranous colitis, mucous disease, intestinal neurosis, mucous colic, mucous croup, colitis pseudo-membranacea, membranous enteritis, myxoneurosis coli, myxorrhœa nervosa, tubular diarrhœa, muco-membranous colopathy. These names have clearly been coined either from a desire to indicate some ætiological belief or to emphasise some dominating symptom.

Symptoms.—Whatever disagreement exists as to the exact cause and nature of this condition there is fairly universal recognition of a symptom-complex. This includes a long history of constipation or of alternating constipation and diarrhœa; the passage of mucus in great or small quantity and in discrete jelly-like lumps or in the form of long membranous "casts"; the occurrence of abdominal pain; and the presence of a large variety of motor, sensory, and mental symptoms, some of which are attributed to auto-intoxication and most of which are conveniently, if unscientifically, lumped together as "neurasthenia." It is largely these symptoms which offer full scope for dissension, for the organicists maintain that they are the effect of some physical disability, whilst the supporters of a "neurosis," even admitting the possible influence of some infection or other physical cause, contend that it is the nervous system which is essentially at fault in responding with unreasonable vigour to a trivial stimulus. There is much to be said on both sides.

Routine Examination.

The first factor in treatment is a thorough investigation. This platitude may be true enough of any condition, but it receives special emphasis in this connexion, for nobody approaches the treatment of a case of chronic colitis without the hope that he may be dealing with a secondary colitis, the cause of which may be eradicated. The gratifying success which sometimes attends the removal of a chronically inflamed appendix with subsequent lavage through a cæcostomy or appendicostomy fistula is a tempting invitation to incriminate the appendix in many cases. But this diagnosis must be established as far as is possible by a careful survey of the symptoms; for unless the appendix is really the cause of the colitis its excision will not ameliorate the intestinal symptoms, and will in addition lower the general health on account of disappointment and of the psychic trauma which any laparotomy may produce.

Further, it should not be forgotten that a general examination may prevent the mortification of treating symptomatically some condition which demands a drastic reconstruction of one's ideas. Twice I have seen an example of rectal crises in which the dominating complaint was the passage of mucus with tenesmus, and three times a copious flow of mucus from the rectum through the pressure of a pelvic abscess; in all these cases "colitis" had been presumed. Above all, the sigmoidoscope should be employed as a routine; a local condition of the rectum or pelvic colon which must receive local treatment, or even a neoplasm may otherwise be overlooked.

Treatment of Mucous Colitis Proper.

1. *Dietetic Treatment.*—With one exception every dietetic régime has aimed at the inclusion of bland substances with little residue. Von Noorden, on the other hand, deliberately selected such articles as Graham bread and fruits with coarse skins and large seeds, with the idea of combating the constipation from which all these patients have long suffered. But by the time the patient comes for treatment she has already found that even the most drastic purgatives have lost their efficiency; the gut is in a spastic condition and any attempt to alleviate the constipation by irritating diet only aggravates it.

Selection of Diet.—According to the urgency of the case the following foodstuffs will be permitted in an ascending scale. Slightly mineralised non-effervescing waters—e.g., Evian, whey, vegetable soups, gruels, spaghetti or macaroni, milk puddings, purées of vegetables, fish and chicken, rusks, plain boiled meat or birds, purée of fruits. Combe's régime, in which a lacto-farinaceous diet predominates, is closely followed. Apart from its non-irritating character it will have some effect on the intestinal flora. In colitis the stools are usually alkaline; a diet low in protein tends to establish a milieu unfavourable to the growth of the anærobic (putrefactive) organisms.

2. *Treatment of the Bowels.*—Purgatives must be strictly prohibited with the sole exception of occasional small doses of castor oil. Psyllium seeds, agar, and liquid paraffin should be given even if, as is generally the case, they have all been utilised in the past and abandoned. In addition, olive oil injections are at once instituted. This treatment, if persisted in, is of the greatest value, both as offering a real cure for constipation and in improving the state of the colonic mucous membrane. After a little instruction these injections can be self-administered. From 8 to 10 oz. of washed olive oil warmed to 100° F. should be introduced into the rectum at a low pressure—a douche can being held or suspended only a foot above the level of the patient who lies in the knee-chest or left lateral position. The oil is retained all night, a sanitary towel being worn to prevent leakage; in the morning the bowels should be comfortably emptied. These injections must be continued nightly for at least a fortnight, and are then gradually reduced, as the bowels are found to act without assistance, until eventually only an occasional injection is required.

Whilst I emphasise the very great value of oil enemata, other methods of intestinal lavage may be admitted if skilfully performed and if the fluid employed is unirritating. The waters of Plombières and Chatel Guyon (among others) are unexceptionable, but strong sulphur waters should be rigidly forbidden. Rarely astringents may be necessary, in which case tannigen or tannalbin will be found most suitable.

3. *Relief of Pain and Flatulence.*—Belladonna is invaluable; probably all sufferers from mucous colitis are vagotonic. This drug may usefully be employed in pill form with menthol and valerian—

e.g., ext. belladonn. gr. ¼, menthol gr. ¼, ext. valerian gr. 1½, pulv. valerian gr. i. Hot applications—e.g., compresses of flannel wrung out in hot water—will always prove comforting.

4. *Reduction of Putrefaction.*—Mention has been made of the influence of food in this connexion. Of intestinal disinfectants I cannot speak with any confidence. Lactic acid, however, is often valuable, but as patients with colitis cannot tolerate milk, a pure culture is preferable to a soured milk. Vaccine therapy is rarely admissible, based as it is on so complicated a bacteriology as that of the intestinal tract.

5. *General Treatment.*—When spa treatment leads to good results it is not easy to apportion the credit due to the climate, the routine discipline, and the suggestive effect. Yet climate is certainly of some importance. I have had the humiliation of experiencing failure after reproducing faithfully and in every detail a treatment which had been remarkably successful in Lausanne. Patients with colitis are very intolerant of cold, and advice to be warmly clad in flannel and to wear an abdominal binder should be insistent. The benefit of a few weeks in bed is explained not only by the rest but by the constant warmth. Enteroptosis is generally present, but as usual it is difficult to estimate the extent of its effect. It is certainly a contributory factor to constipation, and benefit from treatment by a suitable abdominal support is unquestionable. Whether anæmia is present or not it is well to give a course of intramuscular injections of cacodylate of iron, sodium glycerophosphate, and strychnine. Exercise must be graduated according to the inclination and physical capacity of the subject, but only open-air exercise should be encouraged. Massage, especially of the abdomen, may be of value but should be stopped if pain is produced. Galvanism has often a sedative effect on the intestinal spasm and the abdominal nervous system in general.

6. *Surgical Treatment.*—Were one satisfied, first of all that the colon itself was diseased, and secondly that it is in any case rather a superfluous organ, one might be more encouraged to consider ileosigmoidostomy or more formidable surgical procedure, of which I have had no personal experience.

7. *Treatment of the Nervous System.*—This is too vast a subject for consideration here. Unfortunately, the majority of patients develop a mental outlook which, if it has not reconciled them to a life of complete invalidism, has at least prepared them to make the worst of a bad job. So they tend to persist in a mode of living which is only too likely to perpetuate the disability—want of exercise, of fresh air, of interests and of occupation. The disappointment of previous failures and the lack of confidence engendered by the contemplation of contradictory views as to the ætiology of their condition do not contribute to an enthusiastic coöperation in what must necessarily be a prolonged undertaking. Inasmuch as the psychical handling of a patient means individual study, it would be tedious to indulge in generalities. But one thing may be mentioned. Although a conscientious adherence to details must be secured, too many sufferers have had their attention so intimately drawn to their excreta as to become monomaniacal. Let the patient understand from the outset that the task of examination must be left to others.

8. *Treatment of Acute Attacks.*—Occasionally the accumulation of large quantities of inspissated mucus leads to an attack of very severe abdominal pain for which absolute rest in bed is imperative. Moist warmth is applied to the abdomen. The diet is reduced to plain Evian water and water-gruel made with crème d'orge, arrowroot, or rice for two days. An injection of morphia and atropine is given for relief of the enterospasm. A large, warm, olive oil enema immediately followed by a pint of warm water is slowly administered. Two hours later evacuation of the mucus will be completed by the injection of two pints of water at 99° F. containing half a drachm of pure oleate of soda.

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Special Articles.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

CONFERENCE OF OHIO HEALTH COMMISSIONERS.

THE State of Ohio comprises a rural population of six millions, divided amongst 88 counties. The public health organisation of this community is very young, as may be judged from the fact that the annual conference of health commissioners held from Nov. 19th to 24th was only the fourth in its history. Ideally each county and each town of 5000 inhabitants or more should be in the special jurisdiction of a health commissioner. Actually there are 42 county commissioners and 26 city commissioners employed as full time public servants, while a large number of doctors in addition give a part of their time to public health work. The health laws of the State provide that all these men shall attend the annual conference at the public expense, and there was, therefore, a good audience gathered at Columbus to hear the distinguished speakers who had been invited to read papers. These included Surgeon-General H. S. Cumming, of the United States Public Health Service; Profs. A. W. Freeman and W. H. Frost, of the Johns Hopkins School of Public Health; Dr. Haven Emerson, professor of public health at Columbia University; Dr. E. R. Hayhurst, professor of preventive medicine at the Ohio State University; Dr. Luisly Williams, and Dr. W. H. Park, as well as other speakers of international fame.

Coöperation of General Practitioner and Health Commissioner.

The most significant lesson of this conference, and one that any European observer could not have failed to remark, was the extent to which the whole medical profession of the State is mobilising itself behind the projective measures of preventive medicine. The president of the State Medical Association was present and pledged the unlimited support of his organisation. The Columbus Academy of Medicine entertained the commissioners at their own house with many cordial and fraternal expressions of goodwill. Moreover, it was clear that the two large campaign measures which have been planned for the coming year will stand or fall by the loyalty with which the profession as a whole supports them. This is clearly an integral part of the policy of the State Director of Health, Dr. John E. Monger, himself a practising physician, determined, so he says, to return to that calling, and one of the methods by which he appears to have succeeded in convincing the doctors of this State that social medicine is not necessarily medicine that has been socialised.

The Cure and Prevention of Diphtheria.

The provision of free antitoxin to all cases of diphtheria is a legal obligation of each health commissioner. Until recently the price of serum had been a good deal higher than just profits for the manufacturer need have dictated. The State Department of Health had arranged to purchase on a large scale at a reasonable rate and the main subject to be discussed was the method of distribution. In the larger cities, as for example in Cleveland, the serum is kept in ice-chests at every police-station. In the country it has sometimes been distributed through the pharmacists and sometimes given to the private practitioner, who must account for its use (thus providing a useful check on the reporting of suspected cases). Both these methods are open to the objection that the serum is frequently not preserved in an ice-chest. A better method seemed to be to keep the whole stock in the office of the Health Commissioner, where it may always be reached in a few hours.

The discussion on the prevention of diphtheria was ushered in by an interesting paper from Dr. W. H. Park, president of the American Public Health

Association and director of the New York City Health Department Laboratories. Dr. Park described the use of the Schick test and toxin-antitoxin immunisation in New York. There it is hoped to immunise this year about 100,000 school-children and some 20,000 children of pre-school age. The response of the public after four years of educational and prophylactic work is distinctly more cordial. The whole work has been carried on by eight doctors, eight nurses, and eight assistants, and the results are shown in the following table, which was obtained from Dr. Park.

Year.	Total cases.	Total deaths.	Deaths per 100,000 population.
1919	14,000	1239	22
1920	14,100	1045	21
1921	15,000	891	16
1922	10,000	876	15

In 1923, if the rates continue for the last six weeks as for the first 46 weeks, there will be about 8000 cases with some 550 deaths, or a rate of less than 10 per 100,000. Dr. Park suggested that the increased incidence during the first two years of the campaign might be due to improvement in reporting cases as a result of the extra attention to the subject of diphtheria. It will be seen that the death-rate has been cut in half, although not more than one-third of the children have been immunised, and no compulsion whatever has been exercised. The Ohio Department of Health has adopted as its slogan, "No child in Ohio need die of diphtheria." Actually some 1000 die yearly from this disease. With 169 health commissioners at work, strongly backed by the whole medical profession and armed with toxin-antitoxin to be supplied by the State, we should see a reduction in mortality even more rapid and more striking than that in New York.

Regular Physical Examinations.

The movement for a "nation-wide health examination campaign" has been sponsored by the National Health Council for some years now. The American Medical Association has also warmly endorsed this movement, as I have indicated in a previous letter. Dr. Haven Emerson, the chairman of the committee of the A.M.A. Council on Health and Public Instruction, introduced the subject with a paper in which he divided the public health movement into three eras: the era of police and quarantine from 1700 to 1900; that of the voluntary health organisations, beginning with the present century; and the present era of health examinations and popular health instruction, which brings the whole public into active endeavour towards the suppression of disease. He showed how all modern health movements, infant hygiene, school hygiene, anti-tuberculosis, &c., are all dependent upon frequent contact between the individual and his physician. The result may be typified by the tuberculosis work in New York clinics. Whereas formerly it was rare to see a new patient who was not in an advanced stage of the disease, last year 70 per cent. of the patients coming to 31 tuberculosis clinics in that city were not tuberculous at all. It is now the rare exception to see a case for the first time at an advanced stage. He suggested that the physician should examine apparently healthy individuals not less often than laid down below.

In the pre-natal period	4 times.
,, first 2 years	20 ,,
From 2–5 years old	Every 6 months.
,, 6–15 ,, ,, ...	Once a year.
,, 16–25 ,, ,, ...	Once in 2 years.
,, 25–60 ,, ,, ...	Once a year.

The public needs to develop a conscience in this matter. At present many people who would be chagrined if their roof were to leak and make a spot on the dining-room ceiling are not at all ashamed if their child's heart leaks. The professional organisations cannot advertise themselves, the need for regular examination must be taught by the voluntary associations and by health officers, but the profession needs to equip itself for this kind of work, for which it has been inadequately trained, and in which it has too little experience.

After a discussion, in which several speakers representing the medical association supported the movement and emphasised the importance of thoroughness and care in making the examinations, Dr. Hayhurst announced the plans that have been made for launching this campaign in Ohio.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

GRANTS TO HOSPITALS AND CONVALESCENT HOMES.

A MEETING of the President and General Council of King Edward's Hospital Fund, for the purpose of awarding grants to the hospitals and convalescent homes for the present year, was held on Dec. 18th, the Prince of Wales being in the chair.

Lord Revelstoke (hon. treasurer) in reporting the amount received for general purposes by the Fund to Dec. 3rd, said that this time last year he had expressed the hope that the income to be derived from the munificent legacies of Lord Mountstephen and Sir Thomas Sutherland would form the nucleus of a permanent increase in the distribution. The Fund had already received a large part of this increased income. The total income from all investments had reached £145,000 this year, as against £114,000 in 1922. On the other hand, ordinary legacies had decreased, although for the past 12 months they still reached the substantial figure of £47,000. The net result was that the Fund was able to distribute £235,000, or £15,000 more than the amount distributed a year ago. The ordinary income from subscriptions and donations had been well maintained, owing largely to an anonymous donation of £6,500 received in May. The estimates also included the amount which the Fund hoped to receive from its largest contributor, the League of Mercy. There was every hope that the sum of £235,000 would be provided very nearly, if not quite out of the current income of the year.

Sir William Collins, in making the annual statement on behalf of the League of Mercy, said that so far as they could tell from the subscriptions at present received, a sum of £14,000 would be handed over to the King's Fund before the end of the year. This would make a total sum of £353,000 handed over to the Fund since the foundation of the League. Adding the grants made to hospitals outside London, the total came to £407,682.

The Chairman of the Hospital Economy Committee (Mr. Leonard L. Cohen) presented the report of the Committee on

Recovery Branches of London Hospitals,

the general conclusions of which were: that, in view of the advantages to the patients, the development of recovery branches deserved encouragement, subject to the proviso that before a branch is established those responsible for its finance should realise that the apparent cheapness resulting from the low cost per bed at the branch was largely illusory; that its establishment was a form of hospital extension and must be budgeted for as such; and that no form of extension should be undertaken without particularly careful consideration both by the hospital and by the King's Fund, until the restoration of voluntary hospital finance had been completed.

Dr. H. Morley Fletcher seconded the adoption of this report, and the motion was carried unanimously

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the Committee on the

Distribution to Hospitals

(including recovery and convalescent branches). This stated that a new principle had been adopted this year in drawing the distinction between the distribu-

tion to hospitals and the distribution to convalescent homes. The grants to convalescent or recovery institutions attached to particular hospitals of London were now included with the grants to the parent hospitals, and the separate distribution to convalescent homes was confined to institutions which were not branches of a hospital. The new procedure had arisen out of an inquiry by the Hospital Economy Committee into the relation between hospitals, homes of recovery, and convalescent homes. Lord Cave's Committee had suggested that the provision of auxiliary hospitals on the outskirts of cities for cases no longer requiring constant medical or surgical supervision might prove an economical method of increasing hospital accommodation, and the hospitals which had already established recovery branches were anxious that the King's Fund should recognise the difference between these branches and ordinary convalescent homes. In determining the amount of the combined grant regard to the extent to which the work at the branch approximated to hospital work on the one hand, or to purely convalescent work on the other hand, had been taken into consideration. The amount placed at the disposal of the Distribution Committee for allocation amongst hospitals and their recovery and convalescent branches at the present distribution was £233,000. The amount distributed last year at the ordinary distribution was £215,000 to hospitals and £3385 in separate grants to recovery and convalescent branches. In June last the King's Fund made a final distribution of £115,000 out of the proceeds of the Hospitals of London Combined Appeal, £150,000 having already been distributed in August, 1922, and £100,000 in October, 1922. The Distribution Committee's report on the whole of this special distribution of £365,000 had been published in the annual report of the King's Fund for 1922. A sum of £5000 which had since been received from the Combined Appeal was included in the present ordinary distribution. The number of hospitals applying for grants out of the ordinary distribution was 116, as against 112 in 1922. The need of maintenance grants continued to be the first consideration, and the Distribution Committee had therefore again limited the grants in aid of schemes of capital expenditure to cases where the work was particularly urgent and was within a reasonable distance of being carried out. The total amount of such grants recommended this year was £30,100, as against £26,500 in 1922. The total grants to maintenance out of the ordinary distribution amounted to £202,900, as against £188,500 in 1922 to hospitals, and £3385 to their branches.

Several of the schemes to which the Fund had made grants in the past were still deferred owing to financial difficulties, and the Distribution Committee recommended that the following grants should be renewed: City of London Hospital for Diseases of the Heart and Lungs, £1000 to improvements; East Ham Hospital, £500 to rebuilding; French Hospital, £100 to improvements; General Lying-in Hospital, £4000 to rebuilding; Hornsey Cottage Hospital, £500 to extension; London Lock Hospital, £3500 balance of grants to reconstruction of the Harrow-road Hospital; Queen Charlotte's Lying-in Hospital, £3100 to new out-patient department and other improvements; Royal National Orthopædic Hospital, £1000 to extension of out-patient department; St. Monica's Hospital, £60 to improvements; St. Thomas's Hospital, £3750 to extension of nurses' dining-room, and £1000 to improvements.

*List of Awards.**

Lord Somerleyton (hon. secretary) presented the list of awards as follows:—

	£
Acton Hospital (of which £500 to deficit on extension, in accordance with the scheme submitted to the Fund)	700
All Saints' Hospital	100
Baby Clinic Hospital (Kensington)	25
Beckenham Cottage Hospital (of which £1000 to extension, in accordance with the scheme submitted to the Fund)	1,200
Belgrave Hospital for Children	1,200
Blackheath and Charlton Hospital	150
Bolingbroke Hospital (of which £1000 to erection of new ward block, in accordance with the scheme submitted to the Fund)	2,000
British Hospital for Mothers and Babies, Woolwich (of which £500 towards the building of the amalgamated hospital, in accordance with the scheme submitted to the Fund)	1,000
Central London Ophthalmic Hospital	600
Central London Throat and Ear Hospital (of which £200 to provision of X ray equipment, in accordance with the scheme submitted to the Fund)	300
Charing Cross Hospital	4,500
Chelsea Hospital for Women (including Convalescent Home at St. Leonards) (of which £1000 to new nurses' home, in accordance with the scheme submitted to the Fund)	1,850
Cheyne Hospital for Children	200
City of London Hospital for Diseases of the Heart and Lungs (Victoria Park) (including Convalescent Home at Saunderton)	3,550
City of London Maternity Hospital	1,000
Clapham Maternity Hospital	300
Dreadnought Hospital (Seamen's) (including Sanatorium at Liphook, and Convalescent Home at Cudham)	3,550
East End Mothers Lying-in Home	600
East Ham Hospital	100
East London Hospital for Children (including Convalescent Home at Bognor)	3,200
Elizabeth Garrett Anderson Hospital (including Recovery Branch at Barnet)	1,650
Eltham and Mottingham Cottage Hospital	25
Evelina Hospital (of which £250 to reduce debt)	1,250
Finchley Memorial Hospital (of which £250 to scheme)	550
Florence Nightingale Hospital for Gent' women (of which £100 to reduce debt)	350
French Hospital	300
General Lying-in Hospital (of which £50 to improvements)	650
German Hospital	300
Grosvenor Hospital for Women	550
Guy's Hospital (of which £1000 to provision of central power station)	11,500
Hampstead General and North-West London Hospital (of which £500 to reduce debt)	3,000
Hendon Cottage Hospital (of which £250 to extension of ward block, in accordance with scheme to be approved by the Fund)	500
Hornsey Cottage Hospital (of which £500 to extension, in accordance with the scheme submitted to the Fund)	650
Hospital for Consumption, Brompton (including Sanatorium at Frimley)	1,250
Hospital for Diseases of the Throat (of which £1000 to reconstruction, in accordance with the scheme submitted to the Fund)	1,200
Hospital for Epilepsy and Paralysis (of which £1000 to extension of out-patient department, in accordance with the scheme submitted to the Fund)	2,750
Hospital for Sick Children	5,000
Hospital for Women (Soho-square)	1,000
Hospital of St. John and St. Elizabeth	750
Infants Hospital (of which £100 to reduce debt and £200 to remodelling of basement)	800
Invalid and Crippled Children's Society Hospital (Canning Town)	400
Italian Hospital	300
Jewish Maternity Home	25
Kensington, Fulham, and Chelsea General Hospital	25
Kensington Dispensary and Children's Hospital	25
King Edward Memorial Hospital (Ealing)	600
King's College Hospital (of which £500 to improvements)	8,000
London Fever Hospital	350
London Homœopathic Hospital (including Convalescent Home at Eastbourne) (of which £250 to reduce debt)	1,800
London Hospital (including Recovery Branch at Reigate)	14,650
London Lock Hospital (to maintenance of Harrow-road Hospital)	600
London Temperance Hospital (of which £1000 to new nurses' home, in accordance with the scheme submitted to the Fund)	3,000
Maternity Charity and District Nurses' Home, Plaistow	200
Medical Mission of the Good Shepherd Babies' Home (Hoxton)	25
Metropolitan Ear, Nose and Throat Hospital	25
Metropolitan Hospital	3,500
Middlesex Hospital (including Convalescent Home at Clacton)	7,500
Middlesex Hospital Cancer Charity	900
Mildmay Memorial Hospital	400
Mildmay Mission Hospital	1,000
Miller General Hospital for South East London (including Convalescent Home at Bexhill)	3,600
Mothers' Hospital of the Salvation Army	325
Mount Vernon Hospital (Fitzroy-square and Northwood)	1,000
National Hospital for Diseases of the Heart	350
National Hospital for the Paralysed and Epileptic (including Convalescent Home at Finchley)	3,700
Nelson Hospital (South Wimbledon) (of which £500 to deficit on extension, in accordance with the scheme submitted to the Fund)	1,000
Northcourt Hospital and Home for Sick Children (Hampstead) (in consideration of the fact that curable cases are admitted)	50

* The Distribution Committee draw attention to the fact that it must not be assumed that the reduction or absence of a grant implies dissatisfaction.

	£
North Islington Infant Welfare Wards	25
Norwood and District Cottage Hospital	450
Paddington Green Children's Hospital (including Convalescent Home at Slough)	850
Passmore Edwards Hospital for Wood Green, &c.	50
Poplar Hospital for Accidents (including Convalescent Home at Walton-on-the-Naze) (of which £500 to new nurses' home, in accordance with the scheme submitted to the Fund)	650
Prince of Wales's General Hospital (including Convalescent Home at Nazeing) (of which £2000 to reduce debt, and £1,000 to extension, in accordance with the scheme submitted to the Fund)	6,050
Queen Charlotte's Lying-in Hospital (including Convalescent Home at Kilburn (of which £250 to reduce debt)	1,550
Queen Mary's Hospital for the East End (including Convalescent Home at Theydon Bois) (of which £2000 to new out-patient department)	5,700
Queen's Hospital for Children (including Convalescent Home at Bexhill) (of which £750 to debt and £250 to additional nurses' accommodation, in accordance with scheme to be approved by the Fund)	4,750
Royal Dental Hospital of London	250
Royal Eye Hospital	750
Royal Free Hospital (of which £1,000 to new nurses' home, in accordance with the scheme submitted to the Fund)	6,000
Royal Hospital, Richmond	650
Royal London Ophthalmic Hospital	3,000
Royal National Orthopædic Hospital (including Country Branch at Stanmore) (of which £1,000 to extension of country branch, in accordance with scheme to be approved by the Fund)	4,500
Royal Northern Hospital (including Royal Chest Branch in City-road, Recovery Branch at Southgate, and Convalescent Home at Clacton) (of which £1000 to new nurses' home, in accordance with the scheme submitted to the Fund)	9,000
Royal Waterloo Hospital for Children and Women (including Convalescent Home at Whippingham)	2,575
Royal Westminster Ophthalmic Hospital	700
St. Andrew's Hospital (Dollis Hill)	150
St. Bartholomew's Hospital (of which £1000 to new operating theatres, in accordance with the scheme submitted to the Fund)	10,000
St. Columba's Hospital	350
St. George's Hospital (including Recovery and Convalescent Branch at Wimbledon) (of which £500 to extension of out-patient department)	6,900
St. John's Hospital, Lewisham	600
St. John's Hospital for Diseases of the Skin (of which £50 to furnishing of nurses' home)	350
St. Luke's Hospital for Advanced Cases (of which £500 to acquisition of new premises, and their adaptation in accordance with the scheme submitted to the Fund)	700
St. Mark's Hospital	400
St. Mary's Hospital (of which £250 to electric lifts)	6,000
St. Mary's Hospital for Women and Children, Plaistow (of which £500 to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	2,000
St. Monica's Home Hospital	100
St. Peter's Hospital for Stone (of which £100 to reduce debt)	350
St. Saviour's Hospital for Ladies of Limited Means (Osnaburgh-street)	100
St. Thomas's Hospital (of which £1000 to reduce debt)	9,500
Samaritan Free Hospital for Women (including Convalescent Home at Amersham)	1,325
Santa Claus Home	50
South-Eastern Hospital for Children (Sydenham) (of which £750 to deficit on new out-patient department, in accordance with the scheme submitted to the Fund)	1,500
South London Hospital for Women	1,250
Stoke Newington Home Hospital for Women (of which £100 to new operating theatre)	150
Streatham Babies' Hospital	25
University College Hospital	7,000
Victoria Hospital for Children (including Convalescent Home at Broadstairs) (of which £750 to deficit on new physio-therapeutic department and nurses' accommodation, in accordance with the scheme submitted to the Fund)	2,950
Walthamstow, Wanstead, and Leyton Children's and General Hospital	600
West End Hospital for Nervous Diseases (of which £500 to improvements, in accordance with the scheme submitted to the Fund)	2,000
Western Ophthalmic Hospital	250
West London Hospital (of which £500 to reduce debt)	5,000
Westminster Hospital (of which £5,000 to improvement of existing hospital, in accordance with the scheme submitted to the Fund)	7,500
Willesden General Hospital (of which £1000 to extension as general hospital, in accordance with the scheme submitted to the Fund)	2,500
Wimbledon Hospital (of which £500 to deficit on new nurses' home, in accordance with the scheme submitted to the Fund)	850
Winifred House Invalid Children's Convalescent Hospital Home	25
Woolwich and Plumstead Cottage Hospital (see special grant below)	25
Total	£231,500

Special Grant.—Woolwich and District War Memorial Hospital Building Fund (to provision of general hospital, in accordance with the scheme submitted to the King's Fund), £1,500.

Sir John Bland-Sutton seconded the motion, which was put and carried unanimously.

The chairman of the Distribution Committee, Sir Cooper Perry, than presented the report of the committee on the

Distribution to Convalescent Homes

not attached to particular hospitals in London, which stated that the sum available for distribution was £2000; the amount distributed to such convalescent homes in 1922 was £1615; grants to the recovery and convalescent branches of hospitals (which amounted to £3385 in 1922), it was pointed out, are now combined with the grants to the parent hospitals. The number of applications eligible for consideration amounted to 40, as against 41 last year.

List of Awards.

Major Harold Wernher (hon. secretary) presented the list of awards to convalescent homes not attached to particular hospitals as follows:—

	£
All Saints' Convalescent Home, Eastbourne	200
All Saints' Convalescent Home, St. Leonards	50
Baldwin Brown Convalescent Home, Herne Bay	25
Beau Site Convalescent Home, Hastings	25
Brentwood Convalescent Home for London Children, Brentwood	25
Brooklands Home (Invalid Children's Aid Association), Worthing	75
Bushey and Bushey Heath Children's Convalescent Home, Bushey	25
Children's Convalescent Home, Beaconsfield	25
Children's Cottage Hospital (in consideration of convalescent cases), Cold Ash, Newbury	25
Children's Home Hospital, Barnet	25
Clevedon Sanatorium (Invalid Children's Aid Association), Broadstairs	50
Convalescent Home for Poor Children, St. Leonards	100
Convalescent Police Seaside Home, Hove	100
Edgar Lee Home (Invalid Children's Aid Association), Willesden	50
Florence Emma Home (Invalid Children's Aid Association), Dover	25
Friendly Societies' Convalescent Homes, Dover and Herne Bay	25
Hamilton House (Invalid Children's Aid Association), Seaford	50
Highgate Convalescent Home for Children, Highgate	50
Home for Invalid Children, Brighton	25
London and Ascot Priory Convalescent Home, Bracknell	100
London and Brighton Female Convalescent Home, Brighton	25
Mental After-Care Association Homes, Fairlight	150
Metropolitan Convalescent Institution, Bexhill, Broadstairs (Children) and Walton	100
National Sunday School Union, Bournemouth	25
St. Andrew's Convalescent Home, Folkestone	75
St. Andrew's Convalescent Hospital, Clewer	25
St. John's Home, Kemp Town (Brighton)	50
St. Luke's Home (Children) (in consideration of convalescent cases), Woodley (Reading)	25
St. Mary's Convalescent Home, Birchington	25
St. Mary's Home for Children (in consideration of convalescent cases), Broadstairs	50
St. Michael's Convalescent Home, Westgate	50
St. Nicholas' Home (Church of England Waifs and Strays), Pyrford	50
Seaside Convalescent Hospital, Seaford	100
Suffolk Convalescent Home, Felixstowe	50
Surgical Home for Boys (in consideration of convalescent cases), Banstead	25
Thomas Turner Convalescent Home for Children (Church of England Waifs and Strays), Broadstairs	50
Tilford Convalescent Home for Children, Farnham	25
Victoria Home for Invalid Children (in consideration of convalescent cases), Margate	25
Total	£2000

Prof. Winifred Cullis seconded the motion which was put and carried unanimously.

The Chairman of the Ambulance Cases Disposal Committee (Sir William Collins), in making a statement on the present position of the inquiry, said that the committee had now completed the oral evidence; the draft report was almost ready for consideration. He hoped the report would be presented to His Royal Highness before the new year was far advanced.

The Prince of Wales then read the following message from the King: "I am highly gratified that the Fund is this year enabled to increase its distribution from £220,000 to £235,000; also that the difficulties facing the voluntary hospital system are being steadily overcome by the methods adopted and advocated by the Fund. I sincerely trust that continued success will attend the work of the council and committees."

Remarks by the Prince of Wales.

Continuing, the Prince of Wales said that the King's Fund was taking another stride forward. The distribution was being increased by £15,000. For the last two years it had been £220,000; this year it was £235,000. Nearly the whole of this was provided from income received during the year, in spite of the fact that legacies were considerably less than in 1922. The increase in income, which had more than balanced the fall in legacies, was chiefly due to the dividends from the bequests of Lord Mountstephen and Sir Thomas Sutherland. But the Fund had also been greatly helped by an anonymous donation of £6500. The novel feature in the report of the Distribution Committee was the new method of dealing with the recovery and convalescent branches of hospitals. The question of recovery branches came up for decision this year because of the inquiry by the Hospital Economy Committee, and the report was an example of the way in which the King's Fund, as Voluntary Hospitals Committee for London, was steadily working through that admirable text-book on Voluntary Hospital Finance, the report of Lord Cave's Committee.

On matters that did not directly affect the Distribution Committee, the other committees would report to the council at the annual meeting in the spring. But there has been an interesting development of the work of the Revenue Committee. Two subcommittees have been appointed. One, under the chairmanship of Lord Burnham, was to assist, partly by general propaganda in aid of the work of the King's Fund and the hospitals; partly by enlisting the help of members of the professions of science, art, literature, law, &c.; and partly, by continuing from time to time some of the activities of the educational auxiliary which did such good work for the Combined Appeal. The other, under Major Wernher, was to assist both the King's Fund and the hospitals to increase their revenue in any other ways not already covered by some existing agency. Besides a nucleus drawn from the Revenue Committee, Lord Burnham's Committee, so far, contained the following members, most of whom were not otherwise officially connected with the King's Fund, but who have shown, through the Combined Appeal or in other ways, their desire to give personal assistance in connexion with their respective professions: Art, Prof. W. Rothenstein; drama, Mr. Dennis Eadie; education, Sir William Beveridge and Dr. Ernest Barker (University of London); Mr. George Smith and Miss M. D. Brock (secondary schools); Mr. J. W. Samuel and Miss C. M. A. Coombs (elementary schools); law, Sir Reginald Acland, K.C.; literature, Mr. W. Pett Ridge and Mr. C. David Stelling; music, Mr. A. J. Hadrill; science, Prof. W. T. Gordon.

On the side of definite propaganda a leaflet, with a foreword by Mr. Pett Ridge, answering questions about the present financial position of the hospitals of London, had already been issued. One of the general objects of propaganda was to bring the hospitals before people, not only or even chiefly as institutions appealing for subscriptions, but as a very important factor in our social organisation, doing essential work both for the sick poor and for the health of the whole community, and to inculcate in the mind of the public generally a greater sense of responsibility for the regular and systematic support of the hospitals on these grounds. The object was to assist the hospitals and the other central agencies, not to compete with them. The central agencies now included the new Hospital Saving Association for organised contributions from employers and employees. Another new piece of work, undertaken at the request of the Voluntary Hospitals Commission, was an inquiry by a Special Committee, with Sir William Collins as chairman, into the question of hospital accommodation for accident cases.

The Prince of Wales, having briefly acknowledged a vote of thanks, the proceedings terminated.

ANNUAL MEETING OF PRESIDENTS OF THE LEAGUE OF MERCY.

On Dec. 19th the Prince of Wales, as Grand President of the League of Mercy, presided over the annual meeting of presidents of the League at St. James's Palace, when he read the following message from the King: "The Queen and I desire to convey to the presidents, vice-presidents, members, and officers of the League of Mercy our warm appreciation of their sustained interest in this great and successful movement. More than a quarter of a century ago, King Edward, himself a firm believer in the voluntary system, instituted the Fund that bears his name, and, two years later, the League of Mercy; and, though during this period many changes have taken place in the hospital world, I feel that this system still commands the confidence and sympathy of all classes."

Continuing, the Prince of Wales said that looking at the statistics of 113 London hospitals it would appear that in the year 1922 the only source of ordinary revenue which showed a marked increase was that of payments made by patients, amounting to £490,000, or £70,000 more than in 1921. Such payments, together with various rival contributory or provident schemes offering prospective advantages, were not without influence on such a central collecting agency dependent on disinterested personal service as the League of Mercy. It was, however, gratifying to learn, on the authority of the Voluntary Hospitals Commission, in their report upon contributory schemes, that most hospitals rely upon the charitable instinct of the public, and maintain the principle that the necessitous poor and the medically urgent must have the first call upon the resources of the hospital. Other rival schemes, such as ballots and similar competitions, contrived to raise funds for charities, had become popular, and had elicited a warning from the London County Council that, in the case of some of them, a considerable percentage of their contributions, which are ostensibly given for charity, finds its way into the pocket of the professional organiser. No such charge could be levelled against the League of Mercy, since all contributions received by its members and paid in through the vice-presidents and presidents went, without any deductions whatsoever, to the maintenance of the voluntary hospitals. He had received the gratifying intimation that the British Charities Association had decided to entrust to the League of Mercy for distribution by it the sum of £1000 in advance derived from their hospitals competition.

Sir Frederick Green, the hon. treasurer, in his report said that the total of the collections this year was in the neighbourhood of £20,500, about £800 less than in the previous year. They hoped to be able to give £14,000 or £15,000 to King Edward's Fund for division among hospitals, and about £5000 to extra-metropolitan hospitals.

TUBERCULOSIS.

The Tuberculosis Campaign in Lancashire.

THE annual reports of the central tuberculosis officer for Lancashire have in the past been animated by a spirit of organised hustle, and the last report, which is for the year 1922, is no exception to this rule. This is the more creditable as there is at present a tendency to lapse from that spirit of constructive reform which was such a driving force at the end of the late war. Rationing of expenditure has been imposed in Lancashire as elsewhere, but owing to economies and fall in prices, the tuberculosis service has been extended and improved in several respects. The institutional accommodation has been increased from 678 beds at the end of 1922 to 772 in October, 1923. A recent survey of the incidence of tuberculosis in Lancashire has brought out striking differences in

the distribution and mortality of pulmonary tuberculosis in various parts of the county, and this investigation, like a similar investigation recently carried out in Denmark, has emphasised the gregarious character of this disease. In 1922 there were 1626 "contacts" examined in their homes or at dispensaries, and in 79 cases definite tuberculosis was discovered. This ratio of 4·86 per cent. is much higher than any random sampling of the ordinary population would produce, and again we see the gregarious element of the disease demonstrated. An eloquent testimony to the tact and efficiency of the Lancashire tuberculosis officers is the improvement in early notification. In 1918, in as great a proportion as 18 per cent. of the deaths from tuberculosis, the disease had not been notified before death. In 1922 this was the case in only 8 per cent., the period 1918–22 showing a steady improvement in this respect. Omissions and delays in notification may, to a certain extent, vary in frequency in different localities with the efficiency of the tuberculosis staff, and the fact that in Lancashire only 8 per cent. of the tuberculosis deaths occurred before notification is a convincing proof of the smooth coöperation of the tuberculosis staff with the general practitioners in the county. Out of 4059 new cases ("contacts" excluded) examined in 1922 by the tuberculosis officers, 3116, or 76·7 per cent., had been referred to the dispensaries by general practitioners and other medical officers. In 1921 this ratio was only 68·9 per cent. A study of the results of sanatorium treatment and a comparison of it with domiciliary treatment shows very clearly that the prognosis is far better for the former. Thus, of 981 sanatorium cases and 728 non-sanatorium cases in the early and intermediate stages and sputum-negative, commencing treatment in the period 1914–18, it was found that only 16 per cent. of the sanatorium patients and 42·6 per cent. of the non-sanatorium patients had died by the end of 1922.

The Ultimate Results of Nephrectomy for Renal Tuberculosis.

In the *Schweizerische medizinische Wochenschrift* for Nov. 29th Prof. F. Suter, of Basel, has published the results of inquiries made in the winter of 1920–21 as to the fate of 204 patients who had undergone nephrectomy for renal tuberculosis between 1896 and 1920. Only seven of these patients could not be traced. In 20 per cent. tubercle bacilli could not be found in the urine, and in at least 70 per cent. of the male patients the genital system was also tuberculous. Only in a few cases was nephrectomy in bilateral disease attempted, but there were several in which the non-tuberculous kidney was at last temporarily damaged, as shown by the presence of albumin in the urine from this kidney. Of the 197 patients who could be traced, 138 were still alive, and 59 were dead. The mortality was considerably higher for men than for women, being 35·6 per cent. for the former and only 22·3 for the latter. This difference was evidently chiefly due to the presence of disease in the genital system of the men; in 81 per cent. of the male patients who died, there were signs of combined urino-genital tuberculosis at the time of operation. The operation mortality was only 2·5 per cent. (five deaths within the first six weeks of the operation). Of the 138 survivors, 82 showed complete recovery, and 35 showed recovery with some permanent defect such as a contracted bladder. The remaining 21 patients had not recovered completely. One of the most striking observations emerging from this investigation is that many patients are very long in dying after nephrectomy for unilateral tuberculosis; among the patients who died from disease of the remaining kidney, the average duration of life after the operation was five and a half years. In the absence of post-mortem examinations, it was not always possible to say whether these deaths were due to persistence of the bladder tuberculosis and nephritis in the remaining kidney or to tuberculosis in this kidney. Prof. Suter concludes that permanent recovery can be effected by nephrectomy in 60 per cent. of all cases of unilateral renal tuberculosis.

The Prognostic Significance of Cavities in Pulmonary Tuberculosis.

It has recently been stated in Germany that cavitation almost invariably means the patient's death within a short time, and that it is most rare to find cavities in persons who have recovered from pulmonary tuberculosis and who have died from some other cause. To throw further light on this matter, Dr. K. Lydtin,[1] of Prof. Romberg's clinic in Munich, has investigated the ultimate fate of 2500 consumptives treated in hospital in the period 1912–20. There were 716 who died in hospital, and among them there were about 650 who showed cavities at the necropsy. There were also 121 patients who showed definite clinical or X ray evidence of cavities, and who yet left hospital alive. Only 79 of these 121 patients could be subsequently traced, and it was found that 66 had died, and only 13 were still alive. These figures give considerable support to the gloomy views expressed in 1921 at the German Tuberculosis Congress in Elster by Dr. Graeff, who suggested that there was little use in sending patients with cavities to sanatoriums unless some preliminary operative procedure, such as a thoracoplasty, had been undertaken.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the principal health statistics of six counties for 1922:—

County.	Estimated population (R. G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality.		
							Legit.	Illegit.	Maternal mort. in childbirth.
Bedfordshire ..	207,916	17·9	12·2	1·0	1·2	2·5	63	111	3·2
Staffordshire ..	710,378	23·0	12·3	0·9	1·1	3·1	81*		3·8
East Sussex ..	253,246	15·6	11·8	0·8	1·5	1·9	52*		4·6
Norfolk	316,976	19·7	12·9	0·9	1·6	—	63	111	—
Lincolnshire (Parts of Lindsey)	254,567	21·1	12·9	1·2	1·2	2·4	71	138	4·1
Hampshire ..	394,665	19·4	11·3	0·8	1·3	1·9	52*		3·6

* Undivided infant mortality.
A line denotes that the information is not given in the report.

Bedfordshire.

Prof. Henry Kenwood believes that for a still further substantial reduction in the infant mortality-rate we must rely on fuller measures of ante-natal work, and he reports that the county scheme, under which the midwives are subsidised to act as ante-natal health visitors, has worked smoothly during 1922. There are still too few maternity hospitals and homes in the county, and the need for a dental service for expectant and nursing mothers is great. The shortage in water-supplies dating from 1921 is still felt in some villages. Dr. Kenwood lays stress on the advantages of earth-closets over the privies and pail-closets usually provided, and shows how easily the latter can be adapted for the use of dry earth and thus rendered more sanitary. The report contains the usual complaint of the dearth of houses and the consequent impossibility of renovating unfit houses. Dr. Ronald T. Herdman submits a separate report as school medical officer. He points out that the raising of the school-leaving age to 14 has created a need for better seating accommodation for the elder scholars, especially the girls, many of

[1] Zeitschrift für Tuberkulose, 1923, xxxix., 1.

whom are found to be stooping and round-shouldered. It is deplored that parents often do not see the need for the provision of spectacles, unless the sight is very defective. This especially applies to the boys, who are expected to take up outdoor work and to do little reading after they leave school. Ear disease is not common among the Bedfordshire school-children, although an examination of 138 leavers showed that 8 had actual discharge. Of the remainder, 6 had a hole in the drum and 23 showed scars, but in most of these there was either only a slight or no defect of hearing. The school entrants have as many bad teeth as formerly, but at the age of 8 there is a marked improvement since the work of the school dentist began. The school dentist, Mr. F. S. Cooper, says the parents are gradually learning about the aims of conservative dentistry. Owing to an insufficient staff, the dental work is mainly confined to children up to the age of 10 years.

Staffordshire.

Dr. W. D. Carruthers reports that there are now 224 trained and only 66 "bona-fide" midwives practising in the county. Since the Midwives Act came into force 110 midwives have been removed from the roll by the action of the supervising authority. Midwives attended about 80 per cent. of the total births in the county, and sent for medical help on 1992 occasions during 1922, compared with an average of 547 for the five years 1905–09. Of 43 severe cases of ophthalmia neonatorum 3 died from other causes, in one case the sight of the left eye was lost and that of the right eye damaged, and in another case the child lost the sight of the right eye, while the remaining 38 recovered without damage. The county council continue their policy of providing midwifery training for suitable candidates on the understanding that when trained each midwife will practise in a definite area for three years. The income will be subsidised up to £120 per annum if she agrees not to select her cases. In the rural districts the County Nursing Association supply the midwifery service. During the year this Association has sent 13 women to be trained as nurse-midwives. Up to the present no maternity homes have been provided, but use is made of the "Mrs. Legge" Memorial Home at Wolverhampton. The county council have fixed a scale for the recovery of fees for medical attendance under the Midwives Act, 1918. The repayment of the whole fee is not claimed unless the weekly income of the family, after deducting 3*s.* 6*d.* for each child under 14 years of age, exceeds 45*s.* The county health visiting scheme provides for 18 combined school clinics and infant welfare centres in the populous areas around Wolverhampton, Walsall, and Stoke. The attendances of expectant mothers were 504, as compared with 378 in the previous year. Dr. Carruthers reports considerable activity in the improvement of sewage disposal schemes and the prevention of the pollution of the rivers.

East Sussex.

Dr. Alex. G. R. Foulerton reports that 1288 houses were completed during the year, 569 under housing schemes and 719 by private enterprise. In view, however, of the serious overcrowding and the cessation of building during 1914 to 1919, existing conditions are not satisfactory, and but little relief has been given by the additional houses provided. The total number of infants born in the county area (exclusive of Hove) during 1922 was 3464. Of these, 2582 confinements were attended by midwives, in 80 per cent. of cases alone and in 20 per cent. acting as maternity nurses. The Maternity and Child Welfare Committee have provided subsidised lying-in accommodation at the Brighton Hospital for Women for 42 cases, and the Crowborough Cottage Hospital for one case. The county council's health visitors have coöperated closely with the East Sussex Nursing Federation. Dr. Foulerton lays emphasis on the great importance of a proper dietary including fresh vegetables and the right kind of fat in preventing tuberculosis, and instances the experience of this country and other countries both during and since the war in support of this view. The continuous fall in the death-rate from pulmonary tuberculosis in East Sussex since the Armistice was interrupted by a slight rise in 1922.

Norfolk.

Dr. J. T. C. Nash reports a considerable advance in the number of new houses erected in 1922. Only 7 new houses, however, were erected in King's Lynn, and unfit houses are still occupied in that borough. Many of the district medical officers of health comment on the fact that the houses provided under municipal schemes are beyond the means of agricultural labourers and others whose earnings do not exceed 30*s.* a week. The lack of new houses of low rental makes it difficult for the sanitary authority to deal effectively with cottages which have become structurally dangerous or are in need of extensive repairs. In the county of Norfolk, in contrast to most other districts, the majority of the births are still attended by doctors. Out of 6248 births only 1353 were attended by midwives alone. Out of these 1353 confinements the midwives sent for medical aid in 238 cases. The Norfolk Nursing Federation exists for the purpose of training, supplying, and supervising nurses, and receives grants from the county council. There are now 83 affiliated nursing associations in the county. The nurses of these associations are used by the county council as health visitors, except in those districts where their three whole-time health visitors work. Dr. Nash draws attention to the need of the encouragement of breast-feeding. While 87 per cent. of the infants under 1 month were breast-fed, 22 per cent. of the infants between 1 and 3 months old and 33 per cent. of those between 3 and 6 months were not breast-fed. There was no shortage of water in Norfolk during 1922.

Lincolnshire (Parts of Lindsey).

Dr. R. Ashleigh Glegg says that the health service of the county is incomplete in certain directions. A maternity home is needed at Scunthorpe. The building formerly used as council offices by the Frodingham Council would be suitable for the purpose. Home-helps are needed during the confinement period. The policy of providing midwives in country districts by grants-in-aid to district nursing associations should be extended. As regards tuberculosis, earlier notification is needed; the provision of hospital accommodation for acute and advanced cases is necessary; better arrangements should be made for after-care and employment after the sanatorium treatment, and the extension of district nursing for advanced cases treated at home is another need. As regards venereal diseases, Dr. Glegg advocates an additional clinic at Gainsborough, some form of notification and legislation to compel treatment until cure is effected. Dr. Glegg draws special attention to the Cleethorpes educational and publicity campaign initiated by the enthusiasm of Mr. Foster, the cleansing superintendent. This campaign has reduced the amount of refuse to be collected "through householders developing a health conscience and burning decomposable refuse."

Dr. Annie T. Brunyate, the maternity and child welfare medical officer, reports that the health-visiting scheme improves as the increasing number of district nurses who act as health visitors extend its operations to outlying areas. There are still large tracts of country, especially in the Wold area, where there are no midwives and no provision is made for the skilled nursing of the mother at her confinement. The amount of dried milk distributed below cost price was less in 1922 than in 1921, partly owing to the revival of industry in Scunthorpe and the ironstone area, but chiefly owing to Government action in cutting off the supply for children over 12 months of age. The effect of this latter step was found to be harmful, but real injury to the health of a considerable number of young children was averted by the (voluntary) Child Welfare Association finding the money to continue the supply on the old lines. Dr. Brunyate thinks that owing to the reduction of the agricultural wage it will be necessary to provide more milk in country areas if the standard of health of children of

large families is to be maintained. The dental treatment provided under the county council scheme is greatly valued by the mothers; free dentures are very rarely provided under this scheme, and it is hoped that in the future the care committees will be able to give more assistance for necessitous cases.

Hampshire.

Dr. Robert A. Lyster is not pessimistic as regards the effect of expenditure on tuberculosis schemes. He points out that a comparison between the triennium 1906–08 with the triennium 1920–22 shows a fall in the general death-rate of 4 per cent. and a fall in the death-rate from pulmonary tuberculosis of 25 per cent. The lack of early notification constitutes the chief obstacle to progress. He expresses regret as to the delay in the provision of a county sanatorium. The work in connexion with maternity and child welfare centres flourishes; the number of centres is now 56. There are only two medical officers. This work costs the county council but little, £300 being voted annually towards the finances of the centres, in addition to trifling amounts towards rent and the necessary travelling expenses of the medical officers and nurses who attend. The inspection of midwives is carried out chiefly by the superintendent of the Hampshire County Nursing Association (to which the county council makes a grant for the purpose). As the result of inspections, 17 midwives were reported during 1922 to be unsatisfactory in some respect and received the necessary warning. The provision of midwives for every part of the county has received much consideration from the county health committee, and as the result the county council has been recommended to make an additional grant of £600 a year to the County Nursing Association on the understanding that the Association will provide midwives in every part of the county not already dealt with. Dr. Lyster comments forcibly on the deception of the public by the trade use of such terms as "egg substitutes" or "egg powders" for preparations which consist of baking powder mixed with colouring matter and starch and in no way resemble eggs in food value.

SCHOOL MEDICAL SERVICE.

Cheshire.

OVER 23,000 individual children were examined during the year, and including those examined by the two school oculists and the school dentist, 11,579 children were referred for treatment. Of these, 64 per cent. completed treatment. During the year the rate-aided operative treatment of enlarged tonsils and adenoids was suspended as part of the economy campaign. Dr. Meredith Young points out how no one who knows the position of the working classes to-day can doubt that there are very many cases where it is quite impossible for the parents to pay even a shilling or two towards an operation of this kind, and he expresses the hope that this form of treatment may be resumed quite soon. Dental disease was recorded in 6 per cent. of those inspected by the assistant medical officer. The school dentist referred 80·3 per cent. of the 6603 whom he inspected for treatment. The large discrepancy between these findings is explained by the fact that the assistant medical officers refer for treatment only the cases where three or more teeth are carious or where sepsis is present; also the dentist's examination is a more searching examination by means of probe and mirror, which goes to show how important is the dentist's inspection. One dentist for the whole of Cheshire seems now inadequate.

One of the assistant medical officers, Dr. W. J. McIvor, reports that he found round shoulders often masking lateral deviation or scoliosis in as many as 1·6 per cent. of the children, "which figure, although far short of that found in secondary schools, suggests that the seeds of deformity are laid early. . . . In some schools the older children are forced to occupy seats made for far younger children, and consequently sit in a regrettably crouched attitude, there being a scarcity of seats of suitable type, while at the same time in other schools in the same area, where the attendance has decreased, there is a surplus." Dr. McIvor suggests that a transfer of seats from one school to another might be made. The prevention of developmental defects, such as spinal curvature, flat-foot, and myopia, is an important branch of school hygiene.

County of Stirling.

During the period from August 1st, 1922, to July 31st, 1923, the total number of children medically examined, including the 16-year-old group, was 10,202, which number comprises 1925 special examinations. Roughly, one-third of the school population was examined. There is one whole-time and one part-time dentist employed for the whole county. The part-time dentist is employed only in the borough of Stirling. Here he found 816 children requiring attention, of whom 128 refused treatment. To get the remainder treated necessitated 1118 visits of the school nurse. In the county it was found that 90 per cent. of the children inspected required treatment, and Dr. Thomas Adam emphasises the necessity for extending treatment to children over 8½ years of age. The total number inspected was 7291, of whom 1249 received treatment, considerably more than double the number treated last year. The increase is attributed to the fact that the education authority have reduced the fee for treatment to 1*s.* from 3*s.*

Dr. Margaret Rutherford, one of the assistant medical officers, writing on employment of children out of school hours in one of the more populous areas of the county, reports: "In spite of the fact that no child apparently suffers from employment, it is to be deprecated that so many of these children are employed for more than 18 hours a week—e.g., one boy who is employed by a dairyman and by a butcher works 40 hours a week, and another boy employed as a cigarette carrier at the railway-station, works 37 hours a week." Twenty-eight of the 95 children examined in this connexion were under the age of 12. Four of them were employed as lather-boys in barbers' shops. The number of children suffering from skin disease was considerably higher than in the previous year. Impetigo was the prevalent disease, and Dr. Adam reports that he recommended the abolition of the school lavatory towels in several instances, "as there is no doubt that in a great many cases infection is conveyed by the use of these towels." Impetigo is, after all, a disease spread by dirty conditions, and though the communal towel is undoubtedly a vehicle of infection, the towel itself is surely a necessity for practical cleanliness. It would in the long run probably have been cheaper to increase the number of towels, but it requires great determination and diplomacy to educate public opinion to appreciate this.

Aberdeen.

The report of the school medical officer, Dr. George Rose, last year dealt in detail with the very insanitary condition of certain of the schools. It is interesting to read that there has been a "straightening up" in general hygiene in the Aberdeen schools, although much has still to be done. Dr. Rose again returns to the need for spray baths. "The baths have not materialised, but there has been a troubling of the waters," and he exhorts the town council, seeing that the expense of swimming ponds is so great, to concentrate on baths where school-children might have a bath once a week during school hours, and adults have the like privilege in the evening. "Many of our townsmen follow occupations which are grimy and dirty, and it is but fair that those who do our unpleasant but necessary work should be afforded the possibility of making themselves clean at a small cost. . . . Accustom a child to a clean body and the habit will continue through life." We hope that Dr. Rose's arguments will prevail.

A comparison of war and pre-war heights and weights showed that the physique of the older school-children had not suffered from the food rationing,

nor by the replacement of pre-war articles of diet by substitutes. The question as to whether the scarcity of milk during the war had injured the babies born at that time, Dr. Rose goes on to say, was the only question that awaited an answer. "That question can now be answered in the negative, for the heights and weights of the past school year show no practical difference from those of pre-war times. Our children have passed through the war scathless. They have no arrears of malnutrition to overtake or to be a mortgage on their health and energy in the future, as is the case among the children of Central Europe." There are only two blind children of school ages belonging to Aberdeen, and these are being educated at Craigmillar in Edinburgh. A class for stammerers has been started. Indeed, Aberdeen appears to have a true conception of the meaning of school hygiene, and in practical application of the term is going ahead steadily. Dr. Rose's reports are always good reading, and he is generally at pains to explain to the authority his reasons for any new step he contemplates. His exposition of the methods for ascertaining the degree of mental defect by intelligence tests is clear and comprehensive.

With reference to the proposals of certain eugenists for the prevention of mental deficiency, arguing that the benefit of the individual should have first consideration, he writes: "There is enough to be done in the carrying into effect of the provisions of the Mental Deficiency and Lunacy Act that provides for the protection of the feeble-minded female and for the restraint, instead of punishment, of the feeble-minded criminal, for these provisions have been comparatively ignored. Let others dream of Utopia. Our time and energy would be better spent in keeping our own doorstep clean."

MENTAL HOSPITALS SERVICE.

IN the annual report of the *Devon Mental Hospital* for 1922 it is recorded that the laboratory has been reopened, and that an operating theatre is under consideration. It is also pointed out that the hospital needs a dental room, verandahs, continuous baths, and ward letter-boxes. The diet has been improved, but is still open to criticism in view of the prevalence of tuberculosis, both the rate of incidence and the death-rate from this disease being considerably higher than the average for British mental hospitals. It is mentioned that the nurses are encouraged to make notes on their cases, these notes being incorporated in the clinical records; the practice may be found of value both to the nurses themselves and to the medical officers.

The *Bucks County Mental Hospital* was overcrowded during the early part of last year, but the return of 142 out-county patients to Oxford has left it in comparatively easy circumstances. Nevertheless, the hospital appears to be understaffed; there are only two medical officers to 609 patients, and the Commissioner observes that the ratio of nurses to patients is unusually low. The maintenance-rate has been reduced to 17*s.* 6*d.* per week.

It was feared at one time that the accommodation at the *Inverness District Asylum* would prove inadequate for the needs of the district. It has, however, remained sufficient, owing, it is stated, to the decreasing population of the Highlands, and further, to a policy of boarding-out suitable cases under single care. Many of the able-bodied patients have been employed for some years on building a reservoir, which is now nearing completion.

The report of the Inspector-General of the Insane, *Victoria* (*Australia*), for 1921, has for some reason not seen the light until 1923. It is a vigorously worded document, demanding numerous reforms of a nature with which we are familiar in England. The chief difficulty is represented by old and unsuitable buildings; one of these is likely to be given up altogether. Although in some respects Victoria appears to be worse off than England in accommodation for the insane, one feature of their organisation is an admirable one which is likely to be followed universally in the course of time, and that is the provision of large and totally independent "reception houses," where recent cases only are received, including voluntary boarders. For our own information it is worth noting that a high proportion of totally irrecoverable cases are sent to these places, including general paralytics, senile dements, and epileptic congenital defectives—patients who should be sent direct to an asylum. The sole function of the reception house is the study and treatment of recent and doubtful cases. Even among these, further subdivision is desirable—separate wards, for instance, are needed for noisy patients. The meaning of this is that there are no limits to the adequate and individualistic treatment of mental disorder; "classification" means a great deal more than the asylum architect of the last century ever dreamt of, and perhaps more than is contemplated in some of the rebuilding schemes of the present day.

The report of the Inspector of Hospitals for the Insane, *Queensland*, presents little more than a brief recapitulation of the main figures in the accompanying statistical tables, and it is therefore difficult to gauge from it the outlook of those responsible for lunacy administration in that State. No suggestion is made that facilities for voluntary treatment are desirable. Three "reception houses" exist, where patients are classified and receive preliminary treatment, but one of these has been closed, the reason for this step not being divulged. A commendable arrangement in regard to the nursing staff has been made, certain nurses who have qualified after five years' training being sent for two years to a general hospital, where they may obtain the State general hospital nursing certificate, thus qualifying for the higher posts in the mental nursing service.

The Services.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. L. C. Martin relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. A. R. Moodie to be Maj. (Prov.).

Capt. E. A. P. Brock (R.A.M.C.), to be Divisional Adjutant 46th (N. Midland) Div., vice Maj. J. R. Yourell, R.A.M.C., who vacates that appt.

ROYAL AIR FORCE.

W. Parsons is granted a short service commn. as a Flight Lt.

FIFTH ITALIAN RADIOLOGICAL CONGRESS.—The Fifth Congress of Medical Radiology, which was recently held in the rooms of the Palermo University, under the Presidency of Prof. G. Scaduto, was remarkable for the great number of medical and technical radiologists taking part. The transactions opened with a paper by Prof. Gortan (Trieste) on Pneumoradiography, and especially on Radiography of Cerebral Ventriculi, illustrated by radiograms showing the technical and clinical details. Prof. Boidi-Trotti (Turin) followed on the X Ray Diagnosis of the Urinary Apparatus, supporting his argument with notes of a large number of cases, and a discussion followed. More than 120 communications were presented to the congress. Profs. Milani, Palmieri, Porro, and Gregori dealt with X ray diagnosis of the alimentary system, and Profs. Balli, Uffreduzzi, Perussia, and Siciliano with exploration of the urinary apparatus. The therapeutical branch of the subject was dealt with by Drs. Attili, Milani, Rossi, Mendoleri, Heuser, Prusciano, Ponzio, and Spinelli. During the congress an exhibition of radiological apparatus was held. At the general meeting of the members the following officers were elected or confirmed in their positions: Chairman, Prof. Bertoletti (Turin); as assistant chairman, Prof. Balli (Modena); as secretary and treasurer, Prof. Ponzio (Turin); and as editor of the *Review*, Prof. Perussia (Milan). The sixth congress will be held in April, 1925, in Trieste, under the presidency of Prof. Massimiliano Gortan, chairman.

Correspondence.

"Audi alteram partem."

FOOT-AND-MOUTH DISEASE.

To the Editor of THE LANCET.

SIR,—The Minister of Health, in a recent after-dinner speech, invited coöperation of medical and veterinary science in respect to the present grave epizootic of foot-and-mouth disease. The morbific agent being as yet not isolated, empirical experience may not be without utility. Mine I now offer has, at least, the merit of being practical; for when under orders by telegram I was "smashed" by a Government scared (in view of medical theories of the period) by my successful propagation of variola vaccine in 1891, I was left without menial servants and morally but not officially (no successor having been appointed) in charge of over 100 calves—the property of the censorious Government. Amongst these foot-and-mouth disease appeared. My medical staff, diminished from day to day by necessary transfer from my condemned establishment, gallantly joined me in cleansing and feeding the animals. This, confirmed by further experience acquired in after years in conditions less Gilbertian under a more enlightened Government, showed me that, with care as to feeding with soft food, constitutional symptoms are rarely severe and recovery results; that conducted with care as to supposed infective matter isolation is efficient, and aerial conduction is improbable; that whilst, in absence of knowledge, it is necessary to disinfect (or better, destroy) dung and urine of the infected, the presumable chief media of spread are the discharges of the mouth and hoofs; that the morbific agent is favoured if the site of deposit be moist and, at least under a tropical sun, is virile but a short time; that judging by a single case witnessed the disease in man is trivial.

If there be any truth in the above, it follows that the only interest as to an infected animal is that it be correctly segregated, and, that being arranged, the important part of further preventive measures is the scrupulous searching for, and destruction of, widely scattered infective matter. This implies inquiry as to the origin and daily history of the animal, holding in mind that whilst fields may be in varying degree in parts contaminated, concentration of infection must be expected not solely in byres and within farmhouse precincts, but in paths leading to them and, indeed, wherever the animal had been driven. Railway cattle wagons and their approaches should be especially suspect.

How to meet the requirements of disinfection under such conditions doubtless has been duly met by the Agricultural Department, within farmhouse precincts, by customary methods; but where paths, earthen floors, and scattered and possibly infected straw fragments beyond such areas are concerned, I believe strongly in the use of flaming. In 1899 I made, in the interests of plague prevention, simple bacteriological experiments on discharge—stained earthen floors, with heat produced by kerosene gas compressed in cylinders, which showed this mode could compete with the use of perchloride of mercury solution. In 1903, in the presence of foot-and-mouth disease, I found a more suitable portable apparatus to be a slightly modified Lucal burner which, at small expense, projects a flame of intense heat under absolute control. This in practice gave full satisfaction. At my request, Lieut.-Colonel (then Captain) S. R. Christophers, proved the utility of the apparatus by complete bacteriological experiments. In the absence of a recognised microbe, *B. coli communis* was utilised by him.

The chief effort of the Agricultural Department has been the slaughter of animals at the net cost of £1,161,000. It would seem it has relied too long upon a method that would be justifiable solely at the commencement of an epizootic, in the absence of isolation accommodation and of inspecting staffs; but a stage must by this time have been reached in areas where this first step has been unsuccessful, where it would now be profitable to erect rapidly cheap isolation shelters with impervious platforms at central points, served by staffs vested with compulsory powers of inspection and furnished with motor lorries for transport of animals thither. A system of slaughter pursued beyond the limits thus suggested must result in concealment by owners and, consequently, the object in view be defeated.

I am, Sir, yours faithfully,

W. G. KING,
London, N.W., Dec. 18th, 1923. Colonel, I.M.S. (retd.)

THE FUTURE OF THE TUBERCULOSIS CAMPAIGN.

To the Editor of THE LANCET.

SIR,—Many who gladly acknowledge the success of the tuberculosis campaign in the past are only too conscious of the greatness of the task before us, and are wondering whether our present methods will suffice to bring us the ultimate success that all hope for.

The question arises, then, what is the world needing in relation to tuberculosis, and on what lines is that need to be met? Are we to concentrate our efforts primarily on the cure of the individual by sanatorium methods? This, of course, would be quite reasonable were our knowledge no more fundamental than that of our forefathers. Such a course, however, would never rid us of the scourge of tuberculosis. The conquest of typhoid, malaria, and small-pox, &c., was attained by working on much broader lines than the mere treatment of individual cases. Has not the time arrived for working on broader and more fundamental lines in relation to tuberculosis? We do rightly in offering the best conditions to the individual to enable him to conquer his disease; and all engaged in sanatorium work can point to cases which for all practical purposes are cured. An article on "Sanatorium Treatment Contrasted with Home Treatment," by Dr. G. L. Cox,[1] is of interest as a demonstration of prolongation of life resulting from the former. Let us then "hold fast that which is good." Sanatorium treatment, particularly with the addition, in suitable cases, of artificial pneumothorax or extra-pleural thoracoplasty, is of tried and proved and established benefit, which no wave of pessimism should deprive us of. Yet the great general question remains untouched. The same may be said of other excellent measures—e.g., the institution of farm colonies, training colonies, and village settlements. Even when we add more definitely preventive measures to our list, such as segregation of infective cases, with its necessary limitations, and educational efforts among healthy and diseased, we still feel that we are doing little more than playing with a situation of vast magnitude and terrible seriousness.

What, then, is the urgent need of our time? We require to get rid of tuberculosis by robbing the bacillus of suitable soil for its development. In other words, a scheme of general anticipatory immunisation is our only hope. This becomes the more evident as we realise that even should our present methods (including the provision of pure milk, and so forth) at length suppress the disease; we should soon lose the degree of immunity that we now enjoy, and become the most susceptible nation on earth, till exterminated by epidemics of acute tuberculosis. We require, then, to replace the haphazard and therefore dangerous means of immunisation that now prevail (through receiving unmeasured doses of living bacilli into our bodies), by methods of immunisation scientific and effective, and withal safe. The greatest national need, then, is a universally applicable preventive remedy applied early in life which will increase the degree of active immunity that we now enjoy. Is tuberculin (whether Koch's, Dreyer's, Nathan Raw's or anyone else's), such a remedy? In the light of Sir Robert

[1] British Journal of Tuberculosis, January, 1923, p. 27.

Philip's experience, with perseverance in the percutaneous use of the older tuberculins, we judge that much can be done curatively and presumably preventively. Sir Robert Philip now definitely recommends the adoption of the preventive use of tuberculin. Dr. Nathan Raw advises the same course. Apart from declared results, the suggestion seems reasonable. Can we sit still and do nothing in regard to so pressing a matter? Has not the time come for a commission appointed by the Ministry of Health to make the requisite inquiries and recommendations so as to guide the profession at this juncture? The ramifications of the tuberculosis scheme throughout the land provide the only organisation existent capable of making a concerted effort on the lines indicated. The tuberculosis dispensary, already so valuable, would find a new raison d'être in the provision of that active immunity which is the crying need of the hour.

I am, Sir, yours faithfully,

Sheffield, Dec. 20th, 1923. R. M. FENN.

OPIUM IN CARDIAC DYSPNŒA.

To the Editor of THE LANCET.

SIR,—Dr. Claude Wilson in your issue of Dec. 22nd writes: "I cannot doubt that morphine must frequently have been used in these circumstances [cardiac "asthma"], . . . but apparently very little has been placed upon record." This he concludes from "an extensive though hardly an exhaustive search through the literature of the subject." In the *Practitioner*, 1869, iii., 342, as recorded by Dr. J. D. Rolleston, *St. George's Hospital Gazette*, xvii., Nov. 8th, 1909, I made known the invaluable aid of subcutaneous morphia (which I have found to be better than "opium") in cardiac and uræmic *dyspnœa* ("asthma" is a term belonging to a totally different clinical series). On turning to three popular text-books at hand—Osler, Fagge, and Price—I find its virtues in this agony duly insisted upon. So precious is it that I have hoped that if any words of mine should survive, it would be that he recommended subcutaneous morphia in cardiac dyspnœa (in the first instance against the protests of his colleagues).

I am, Sir, yours faithfully,

Cambridge, Dec. 20th, 1923. CLIFFORD ALLBUTT.

THE TREATMENT OF PYREXIAL TOXÆMIAS WITH ANTIPYRETICS.

To the Editor of THE LANCET.

SIR,—Since Sir Archdall Reid [1] and later other observers have advocated the above treatment I have used the same methods in five different cases with the striking results given in the following short résumé.

1. A case of puerperal fever occurring on tenth day; midwife's case, in which I was called in to suture perineum; wound healed primary intention, but fever of 102° F. and pulse-rate 120 on date mentioned. No physical signs except malaise; antipyretic treatment ter die. Result, temperature normal in 48 hours; no further trouble.

2. A very debilitated woman with physical signs strongly suggestive of pulmonary tuberculosis, but sputum negative. Temp. 102°–104° F., pulse 130; condition grave. Same treatment; normal temp. in three days; no further pyrexia and gradual return to health except, of course, the physical signs in chest still remain, though to a less marked extent.

3. Case of puerperal *B. coli* pyelitis with high fever (up to 104·2° F.) and unaccompanied by rigors; flooded with alkalies, as so strongly advocated by Mr. Frank Kidd, my late chief at the London Hospital, and antipyretic treatment, p.r.n. In this case I reduced the temperature on one occasion by 6° to normal in four hours with simply 10 gr. of aspirin. Profuse sweating occurred, followed by refreshing sleep. The alkali treatment, of course, in this case was of primary importance, but here the promotion of free sweating with accompanying reduction of temperature was a most useful adjunct, the skin acting as an accessory kidney in the elimination of toxins.

4, 5. Two cases of adult lobar pneumonia; crisis in two days; respiratory distress for one day only. These two cases were remarkable for the absence of the distress so often seen in adult lobar pneumonia. In the first case the patient was sitting up in bed in two days working out football competitions, and his wife pooh-poohed the idea of pneumonia, though his right lower lobe presented all the classical physical signs of that condition. The second case when first seen had a temp. of 104·4° F., with delirium, and, as before stated, in 48 hours the temp. was normal and all anxiety passed. The lung condition, of course, goes through the ordinary process of resolution, but any treatment which banishes the distressing respiratory embarrassment which is so prominent a feature of this serious condition is well worth a trial.

[1] THE LANCET, 1921, i., 1211.

For the use of your readers who are not familiar with Sir Archdall Reid's proposals as to treatment I may state that they are the exhibition of an antipyretic powder, as follows:—

Pulv. ipecac. co., gr. v.
Aspirin, gr. x.
Phenacetin, gr. v.

I myself have not strictly adhered to the above formula, sometimes incorporating quinine as well as the other drugs. No ill results follow (stimulants are given p.r.n., especially after the profuse sweating that occurs). The elimination of toxins in the sweat seems to be the secret of this treatment, and it is one that is well worth a trial in all forms of pyrexial toxæmia, being simple, inexpensive, and efficacious.

I am, Sir, yours faithfully,

Exeter, Dec. 15th, 1923. CHARLES H. CARROLL.

THE SHORTAGE OF NURSES.

To the Editor of THE LANCET.

SIR,—With reference to a letter in your issue of Dec. 15th on the shortage of nurses, I should like to say how strongly I agree with Miss Gertrude Cowlin in concluding that to establish a subsidiary nursing service would result in a poor nursing service for the community. In Russia this method has been in practice for many years, being the system adopted at the same period that Florence Nightingale propounded our present system in England. I had the opportunity of seeing the results—i.e., the care of acute illness by women totally unfit and untrained to carry out skilled nursing, the "Na-na"; and the qualified or fully trained nurses performing duties which would usually be confined to the medical profession in this country. The system has served to create, with the "Feldshers," men and women who undergo a short medical course of two years, terminated by examination, a subsidiary medical service, which has led to the majority of the poorer members of the community receiving no really skilled treatment, either medical or nursing. The present commissar of health, realising that the existing system does not provide the best outlook for the people, has invited help from British nurses to establish in Moscow a training school for Russian nurses under the English system.

I am, Sir, yours faithfully,

MURIEL A. PAYNE, S.R.N., A.R.San.I.

Woodford, Essex, Dec. 17th, 1923.

EDINBURGH ROYAL INFIRMARY.—At a meeting of the League of Subscribers, Sheriff Crole, member of the Infirmary Board, stated that the finances of the infirmary were now in a sound position. The expenditure for the past year amounted to £119,810, an increase of only £50 over the previous year, although the number of patients treated had greatly increased. Considerable economies had been effected, but efficiency had in no way been impaired. The cost per bed per annum was now £133 11*s.* 4*d.*, representing a decrease of £3 2*s.* 11*d.* from the previous year's figure. The total ordinary income had increased to £110,150 from £99,171. The voluntary contributions amounted to £68,721, an increase of £3009 for the year. This, he said, was another triumph for the voluntary system of hospital maintenance. The proposal to add two small wards to the ear, nose, and throat department, at a cost of about £12,000, will shortly materialise, and an extension in connexion with the X ray department is contemplated. Although the number of people who received treatment was large—15,043 in-patients and 46,693 out-patients—there was a waiting list of 17,000 to 18,000, and extension was urgently needed.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a Congregation held recently the following degrees were conferred:—

M.D.—A. W. Uloth, Pembroke; E. H. R. Altounyan and E. Wordley, Emmanuel.

M.B. and B.Ch.—E. Tagoe, Christ's.

M.B.—R. N. P. Wilson, Pembroke; G. H. Caiger, Caius; and C. Dunscombe, Downing.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR MEDICAL AND SURGICAL DEGREES.

Part I., Surgery, Midwifery, and Gynæcology.—E. V. Beale, King's; F. M. Collins, Pembroke; H. V. Coverdale, R. Cove-Smith, and W. H. Craib, Caius; G. J. V. Crosby, Christ's; D. E. Cuffey, Pembroke; J. R. B. Dearden, John's; V. W. Dix, Trinity; J. H. Doggart, King's; R. B. Fawkes, Queen's; W. H. Gervis, Caius; R. A. Highmoor, Clare; J. W. Hope Simpson, Trinity; R. Jackson, Downing; J. P. W. Jamie, Emmanuel; W. A. Lister, Trinity; H. R. Matthews, Corpus Christi; G. A. Metcalfe, Jesus; H. D. N. Miller, Down; S. M. Milner, King's; E. G. Morris, Clare; J. Ness-Walker, John's; C. E. Newman, Magdalene; G. G. Penman and A. D. Porter, Pembroke; E. A. B. Pritchard, King's; R. H. T. Rea and R. L. Rhodes, Caius; W. L. Roberts, Clare; R. A. M. Scott, Emmanuel; W. G. Scott Brown, Corpus Christi; F. A. H. Simmonds, Emmanuel; L. V. Snowman, Down; G. L. Thompson, Trinity; G. K. Thornton, Corpus Christi; K. W. Thorp, Caius; F. C. O. Valentine, Magdalene; S. Vatcher, Trinity; A. L. Walker, Pembroke; R. K. Wilson, Trinity House; F. R. Winton, Clare; and H. Yates, King's.

Part II., Principles and Practice of Physic, Pathology, and Pharmacology.—J. C. Ainsworth-Davis, Christ's; L. J. Bendit, Queen's; N. E. Chadwick, John's; W. H. Craib, Caius; F. E. Graham-Bonnalie, Christ's; G. T. Henderson, Caius; E. G. Holmes, Christ's; J. W. Hope Simpson, Trinity; R. Jackson, Down; L. P. Lockhart, Caius; C. A. Lupton and R. J. Lythgoe, Trinity; T. K. Maclachlan, Pembroke; F. H. Mather, Sidney Sussex; G. A. Metcalfe, Jesus; G. C. Millis, Queen's; E. S. Page, House Selwyn; R. J. V. Pulvertaft, Trinity; B. E. Schlesinger, Emmanuel; M. H. Webb Peploe, Trinity; R. H. White, King's; R. K. Wilson, Trinity House; and G. M. Brown, Girton.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Dec. 19th the Vice-Chancellor, Mr. H. J. Waring, being in the chair, Dr. Eleanor M. Scarborough was appointed as from Jan. 1st, 1924, to the recently-instituted readership in Pharmacology tenable at the London School of Medicine for Women. She has held resident clinical appointments at the Elizabeth Garrett Anderson Hospital and at the Royal Free Hospital. In October, 1919, she was appointed demonstrator in pharmacology at the London School of Medicine for Women, and since 1921 she has been assistant lecturer in that subject at the school. Prof. Hugh MacLean was awarded the William Julius Mickle Fellowship (of the value of £200) for 1924 in respect of the work which he has carried out during the past five years in experimental medicine. This Fellowship is awarded annually by the Senate, under the terms of the Mickle bequest, to the man or woman who, being resident in London and a graduate of the University, has done most to advance medical art or science within the preceding five years and has therein shown conspicuous merit.

At examinations held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—John V. C. Braithwaite, Guy's Hosp.; Rhys T. Lewis, Univ. Coll. Hosp.; Montague Maizels, Guy's Hosp.; Merell Philippa Middlemore, London Sch. of Med. for Women; and Manek Jamshedji Panthaky, King's Coll. Hosp.

Branch III., Psychological Medicine.—Mary R. Barkas (University Medal), St. Mary's Hosp.

Branch IV., Midwifery and Diseases of Women.—Sybil G. Mocatta (University Medal), St. Mary's Hosp.

Branch VI., Tropical Medicine.—Trevor L. Bomford, St. Bart.'s Hosp.

M.S. EXAMINATION.

Branch I., Surgery.—Hugh J. McCurrich, Bristol University and St. Bart.'s Hosp.; and Alan C. Perry, London Hosp.

UNIVERSITY OF SHEFFIELD.—The following students have recently passed the Final Examination for the degrees of M.B., Ch.B.

George Ritson Bailey, Lancelot Harry Copping, Thomas Ronald Forsythe, Cyril Handley Greaves, Carl Myers, John Emmet Tannian.

UNIVERSITY OF MANCHESTER.—At examinations recently held the following candidates were successful:—

FINAL M.B. AND CH.B. EXAMINATION.

New Regulations.

C. N. Aldred, William Broadhurst, J. F. Bromley, Bessie E. Cook, R. W. Fairbrother (distinction in Obstetrics), Madge E. Heywood, Bertha Kahn, L. W. Kay, A. C. Kelly, V. F. Lambert, W. B. McKelvie, Marjorie M. O'Dea, R. W. Parker, Marjorie Robinson, Kate B. Scott, Agnes Seaston, H. F. Shaw, Marjorie Thompson, Sarah Walker, Jane M. Wilde, and Marjorie Youatt.

Obstetrics and Surgery.—R. S. Adam, Margaret A. Bromhall, W. C. V. Brothwood, T. A. Brown, J. A. Crowther, Mary S. Davies, T. E. Davies, Reginald Ellis, Leo Fay, C. R. Fielding, A. G. Forbes, Anne H. Glancy, J. W. Graham, Philip Gregory, Edward Holmes, Winifred L. Horton, J. N. Hudson, Phyllis Kaufmann, David Kemp, Hilda M. Linford, F. R. Lockhart, Samuel Pope, L. J. Prosser, Albert Riley, Eileen Sheehan, Dorothy Simmons, John Sims, G. S. Smith, A. R. Somerford, James Troup, H. M. Turner, Charles Wilcocks, and Geoffrey Williamson.

Obstetrics.—J. H. Anderson, Solomon Bernstein, Madge E. Edwards, P. G. Johnston, Alice M. Orrell, R. F. Stubbs.

Forensic Medicine.—C. E. W. Bower and Gladys F. A. McLean.

Hygiene and Preventive Medicine.—C. E. W. Bower, Charles Eccleston, Gladys F. A. McLean, W. M. Roberts, H. C. Smith, and Eric Whiteside.

THIRD M.B. AND CH.B. EXAMINATION.

Pathology.—Louise Aronovich, H. K. Ashworth, Marion L. Bainbridge, C. H. Bamford, A. R. Barber, J. R. Beal, Pieter Bester, R. H. Blackburn, *N. W. Bolton, Lilian Bond, G. H. H. Booth, Kathleen M. Boyes, Lillie M. Burton, Marguerite E. Cliff, T. K. Clifford, John Crook, T. A. Danby, A. A. Davis, N. E. Delaney, L. F. Evans, Mary Evans, J. D. Farquhar, Barnett Fink, S. J. Firth, Riad Girgis, Dorothy Guest, T. S. Hanlin, Zaky Hanna, Mary Harburn, F. S. Hawkins, Barnett Hirsh, G. D. Hithersay, J. L. Holt, *R. L. Holt, John Hunt, E. P. Hyde, May Johnson, Walter Johnson, G. W. Jones, J. T. C. Keddie, J. H. Kitson, C. T. Marshall, W. D. Mitton, S. L. Mucklow, Archer Pearson, Harry Pigott, R. H. Poyser, *Joan Robinson, M. R. Sagar, N. F. Seed, Raphael Shaffer, W. H. Shepley, A. D. Shubsachs, W. S. Slater, Agnes G. Smiley, *F. H. Smirk, Graham Stenhouse, Jane B. Stubbs, J. K. Thomas, Jacobus Viljoen, J. C. Wilson, and Reginald Wood.

* Distinction in Pathology.

Pharmacology.—R. S. Abraham, Agnes M. Bodoano, Gerald Bradley, Gladys Brocklehurst, J. F. Caithness, D. E. Francis, Zaky Hanna, L. C. Peringuey, Mary I. Prentice, Francis Reynolds, Evelyn I. M. Sheppard, W. C. D. Walmsley, and R. T. Wimmer.

UNIVERSITY OF GLASGOW: NOMINATIONS TO FELLOWSHIPS.—The following awards have been made by the Senate:—

Faulds Fellowship in Medicine: Dr. John M. Johnston. Senior Arnott Prize, Physiological Physics: David P. Cuthbertson, B.Sc., and Herbert H. Pinkerton (equal). Junior Arnott Prize, General Physics: William A. Mackey. James Macfarlane Bursary: William A. Mackey and William F. Greer (equal). Lorimer (Medical) Bursary in Botany: William A. Mackey. Lorimer (Medical) Bursary in Physics: John M. Brewster. Mackintosh Bursary in Mental Science: Max Gorfinkel. Walton (Medical) Bursary: James Morrison. Brisbane (Medical) Bursary: Alan A. MacDougall, M.A. Dr. Thomas Gibson (Medical) Bursary: Annie B. Price. Joseph Coats Memorial Scholarship in Pathology: Dr. Sarah H. Nelson. Frederick William Penman Memorial Scholarship in Pathology: Dr. Sarah Nelson. Arbroath (Medical) Bursary: Herbert H. Pinkerton. Monteith (Medical) Bursary: John Chalmers. Rainy (Medical) Bursary: James Wemyss. Gardiner (Medical) Bursary: David F. Anderson. Andrew Weir (Medical) Bursary: Gavin McCallum.

A house in the neighbourhood of Glasgow University has been gifted to the Students' Welfare Scheme by Mr. J. M. Robertson, of Glasgow. It is to be used as "a professor's house, hostel, or other university purpose calculated to preserve the amenity of the neighbourhood."—The University Library has been left a legacy of £500, free of legacy duty, by the late Mr. J. F. Orr, writer, of Glasgow.

UNIVERSITY OF EDINBURGH.—The University Court, on Dec. 17th, received the offer of £50,000 from the Rockefeller Foundation Trustees for the fuller equipment of the medical teaching and research facilities. This munificent gift is to be devoted specifically to the establishment of a clinical laboratory in connexion with the Royal Infirmary and to complete the endowment of the Professorship of Surgery on a full-time basis. The Trustees have offered, in addition, an annual grant of £1750 for a period of not less than five years, to meet certain salary charges in clinical medicine and clinical surgery. The need for extension in the Edinburgh Medical School has been acutely felt in recent years, particularly in regard to post-graduate teaching, the extension demanding both space and money. While space still remains a problem, the Rockefeller gift should enable the University to enjoy in the future an even higher reputation than it does at present; nor will the additional advantages be merely academic, in no less degree will the patients benefit from them. The proposals for coöperation in the University's plans of rearranging the departments of medicine and surgery were presented to the Rockefeller Trustees by Dr. Richard W. Pearce, the Director of the Division of Medical Education of the Rockefeller Foundation, and the Trustees authorised Dr. Pearce to assist in the realisation of these plans as far

as financial coöperation with the Foundation was involved. Before the offer can be formally accepted the permission of the managers of the Royal Infirmary must be obtained for the construction of the necessary buildings. Negotiations will doubtless be opened immediately.

At the graduation ceremonial, held in the M'Ewan Hall on Dec. 14th, the following degrees were conferred:—

DOCTOR OF MEDICINE.

*Robert C. Begg (in absentiâ), Ronald M'Donald Cairns, Ethel Cassie (*née* Wiseman), †Alexander Dower, Francis Ernest Gunter, William Thompson Hall, Alexander Joe, Isaac H. Lipetz, Andrew M'Farlane (second-class honours), *Douglas Alexander Miller (second-class honours), David H. Russell, and *Claude W. Stump.

* Awarded Gold Medal for thesis. † Commended for thesis.

DOCTOR OF PHILOSOPHY.

In the Faculty of Medicine.—Henry Dryerre.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

James B. Adamson, Harry Allan, Frank Allardice, Ian R. Anderson, David Arnott, James N. Banks, David M. Bertram, Camaralzama C. Boudou, Edmund R. Boyd, Joseph Braithwaite, Jessie R. Brash, Edward H. Brindle, John C. R. Buchanan, Andrew Bury, John M. Cale, Margaret D. Cairns, Kathleen S. Campbell, Roy F. Campbell, James T. D. Clark, James L. Connacher, John G. Cormack, James W. Cromarty, Ewen G. Dalziel, Alexander W. Davidson (second-class honours), John Davidson, James P. Davie, Hendrik A. N. Dippenaar, William G. Dobson, Isabel M. A. Doeg, Leslie G. Drury, Robert H. Dunlop, Lister M. C. Duthie, Robert W. Eason, Margaret G. Falla, William Foote, William M. Ford-Robertson, Walter M. Forster, William C. Fothergill, Donald A. Fraser, John F. Fraser, Eric M. R. Frazer, Laurence S. Frost, Maurice Gelb, George M'K. Gibson, Sydney Gill, Alexander Gillies, Alexander C. Gillies, David Gold, Margaret H. Gordon, Allan D. Gould, Ralph W. Graham-Yooll, Lionel P. Greson, Alexander B. Guild, William F. Hamilton, Herbert C. Haslam-Fox, Leo E. Henderson, Charles V. Hendry, Hieronymus Hoffmann, Ellis G. Hunter, Louis Jaffit, Eric W. C. Jobson, Willian Jones, Morton Kahn, Isabella Kerr, Jenny C. King, Walter H. Kluge, Annie G. Learmouth, John G. Leebody, Alexander Leishman, Robert V. Liddell, Elizabeth M. Lindsay, Robert Lockhart, Graham Louw, David B. Low, Robert I. M'Alley, William N. M'Arthur, Joseph Maccabe, George H. M'Cafferty, Sydney J. M'Cafferty Andrew W. M'Cay, Peter A. M'Credie, Donald Macdonald John D. Macdonald, Robert Macfiggans, Jane Clarke M'George, Janet M'Lean Mackay, David T. Mackie (second-class honours), John B. Mackie, Catherine J. Maclaren, Ian H. Maclean, Samuel R. Macmillan, Duncan A. B. Macnicol, George S. Marr, Ebenezer B. Mercer, Hugh Miller, John Milne, George W. Monro, John V. Neilson, Alexander S. Nicol, James T. B. Nicoll, Bryce R. Nisbet, George Ormiston, Violet Oswald, James R. H. Pasqual, Douglas G. Paterson, William D. Paterson, Ian A. M. Paton, Milorad Petrovitch, Walter J. R. Pickles, Robert K. Porteous, Geoffrey Priestman, Percival V. Pritchard, Walter H. B. Ramsay, William Ramsay, Jeanne V. Rees, Richard E. B. Rees, John J. Robb, George Robson, Alfred Rosenbloom, Robert J. Rosie, Margaret G. Ross, Hyman L. Rubin, Cecil G. A. Salvesen, Robert E. W. Sandison, Alexander Scott, Jocelyn M. S. Scovell, John A. Shaw, Andrew Simpson, George W. Simpson, Ann F. G. Smith, Cornelius R. Smuts, Neil R. Smuts, William R. Sprunt, John P. Stewart, Frank M. Stuart, Thomas R. M. M. Sutherland, William R. Terry, Felix F. du Toit, Thomas S. Torrance, Frank Towers, Elsie M. Walker, Edwin D. M. Wallace, Hugh K. Watson, John H. Watson, Frederick H. Webb, Alexander B. Williamson, Winifred Wood, and George W. Yule.

The Ellis Prize in Physiology has been awarded to Dr. May L. Walker.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Dec. 19th the following candidates, having passed the requisite examinations, were admitted Fellows:—

Albert C. Abbott, Thomas G. D. Bonar, Hendrik J. P. Bruwer, Gerrard Burnett, Thomas L. Clark, Robert M. Dannatt, Ernest C. Fahmy, Griffiths J. Hughes, William Ibbotson, Hubert S. Jacobs, Thomas P. McMurray, James H. Rawlinson, Creina Shepherd, Charles H. Thomas, Henry E. Y. White.

Sinnatamby Thambipillai having passed the requisite examination was admitted a licentiate of the College.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful:—

FINAL MEDICAL EXAMINATION.

Part II., Medicine.—Wentworth A. Taylor (passed on high marks), Patrick K. Dixon, Joseph E. Eliason, John M. Mounsey, Henry Isaacson, Israel Marin, Jan Andreas du Toit, Etienne R. Hafner, Jack A. Levitt, John S. Glasgow, William L. W. Smith, Robert E. Fausset, William F. Whaley, Douglas L. Hemmingway, Gladys Weatherill, Kathleen E. Hill, Alfred J. Beckett, John M'Clelland, Francis C. B. L. B. Crawford, Charles W. J. Ingham, William D. Speedy, Dermod H. F. Milmo, James V. Williams, Pieter C. du Plessis, Anthony B. Monks, Albert V. Wood, and Margaret O'Neil.

Surgery.—Patrick K. Dixon, George F. T. Saunders, Robert L. C. Fisher, Morris Cohen, N. E. H. P. Williams, William L. W. Smith, John L. Stuart, John J. Laing, James E. Deale, Cecil J. M'Quillan, John M'Clelland, Henry W. L. Dale, Louis Harris, Martha Reid, Rudolf Schaffer, Charles W. J. Ingham, James J. O'Grady, Frederick G. Brown, Jack M. Gordon, Isobel G. Smith, Johannes H. Stals, Philip P. van der Merwe, Kathleen E. Hill, James A. MacDonald, Henry Isaacson, Hans J. Hugo, Isabella H. Speedy, Eileen A. Boyd, and Jan Andreas du Toit.

Midwifery.—Desmond K. Lyons, John K. S. Thompson, Otto G. Wilde, George A. Cowan, John R. Bradshaw, and George Robinson (all of whom passed on high marks), Lewis C. Brough, James S. Armstrong, Simon Wigoder, Louis E. J. Werner, John A. MacDonnell, John N. Atkinson, John H. Bowyer, Wilfred H. Anderson, Robert E. Steen, Dorothy J. Booth, François J. Swanepoel, James W. Wallace, Lionel S. Levitt, Cornelius J. N. Loubser, Kenneth F. Mackenzie, Leslie M. Whitsitt, James L. Marshall, Joseph Morris, John L. F. Steele, Jerreth Horwich, William A. Dickson, Charles J. du Plessis, Godfrey W. Garde, Robert Warnock, John D. Watson, William A. Redmond, Eileen Brangan, Norah M. Gilcriest, Paul N. H. Labuschagne, Richard L. G. Proctor, Israel Strasburg, Herbert Birney, Alexander L. Dobbyn, Raymond J. G. Hyde, Bertha H. Lawler, Paul D. Piel, Herbert W. Strong, Lucy E. R. Pigott, Dorothy I. Henry, Howard St. George McKenny, Robert G. F. Thompson, George D. Rankin, Ralph A. Webner, Robert W. Harte, Louis P. Sayers, and Angel Valentine B. Crawford.

FINAL DENTAL EXAMINATION.

Dental Surgery and Pathology; Dental Mechanics and Metallurgy; Orthodontia.—John C. M. Shaw, John H. B. Tuke, Frances E. Bailey, Thomas R. Wall, James A. N. Dickson, and Maureen Claire Mulhern.

ROYAL COLLEGE OF PHYSICIANS AND ROYAL COLLEGE OF SURGEONS IN IRELAND CONJOINT EXAMINATIONS.—At examinations held recently the following candidates were successful:—

THIRD PROFESSIONAL EXAMINATION.

Sybil Atkinson, Abraham Clein, C. W. Coffey, W. Gilbert, J. Graff, J. P. Hederman, T. T. Joyce, Kathleen Keirans, E. H. McGinty, E. G. H. McNally, J. J. McSharry, A. H. Mackay, G. A. Moorhead, P. J. Mulcahy, J. C. Murphy, W. G. Myers, J. O'Neill, C. A. O'Riordan, T. S. Osborne, J. Rafferty, J. F. Scales, E. Whelan, and D. G. White.

FINAL PROFESSIONAL EXAMINATION.

Francis J. N. Carney, Andrew E. Clements, Michael H. Dobbyn, Francis D. Fitzpatrick, William G. C. Fitzpatrick, Henry I. Hawkes, Rosaleen H. Hoskin, Kathleen O. M. Kennedy, Catherine M. King, George A. Little, John J. Marlborough, Sarah Matson, Francis McConnell, Edward A. McManus, John J. O'Donnell, James O'Donnell, William O'Neill, Vincent J. O'Toole, Herbert C. Patterson, Gilbert F. Plant, Patrick B. Ryan, Jonathan Unsworth, and Samuel P. Wallace.

DIPLOMA IN PUBLIC HEALTH.

Thomas K. Reddin and John J. Ryan.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—At recent examinations the following candidates were successful:—

FINAL FELLOWSHIP EXAMINATION.

Charles Cooper, Joseph C. Gillespie, Margaret Holliday, Norman P. Jewell, Robert J. May, Richard W. Power, and Frederick H. Whyte.

FINAL DENTAL EXAMINATION.

Robert H. England, John I. Hughes, Henry F. B. Kelly, Valentine McCarthy, Kevin V. O'Farrell, and James F. Pegum.

WEST OF SCOTLAND FOREIGN SERVICE MEDICAL CLUB.—This Club, which consists of members of the medical profession resident in the West of Scotland, who were overseas on service during the war, held its fifth annual dinner in the Grosvenor Restaurant, Glasgow, on Dec. 18th, the President, Colonel A. Dryden Moffat, M.D., in the chair. There were present as guests of the evening, Dr. Thomas Finlayson Dewar, President of the East of Scotland Foreign Service Medical Club, Dr. William F. Gardiner, secretary of that Club, and Prof. Archibald Main, D.D., of the University of Glasgow.

THE LATE SIR JOHN WALTON BROWNE.—Sir John Walton Browne, who died on Dec. 19th in his 79th year, was consulting surgeon to the Belfast Royal Hospital and to the Ulster Hospital for Children, and was well known as an eye, ear, and throat surgeon. He was the son of the late Dr. S. Browne, R.N., formerly Mayor of Belfast, was educated in his native town, in London, Dublin, and Vienna, and graduated in Arts at the Royal University of Ireland in 1863, taking his medical degree four years later. For some time he had a general practice in Belfast before becoming surgeon to the Belfast Ophthalmic Hospital and lecturer in ophthalmology at the Queen's University of which he was a senator. He was at one time president of the Ulster Medical Society, of the North of Ireland Branch of the British Medical Association, and of the Ophthalmological Section of the British Medical Association when that body held its annual meeting at Belfast in 1909. He was knighted on the occasion of the King's visit to Belfast in 1921.

Sir Robert W. Philip has been appointed an Honorary Physician to His Majesty in Scotland, in the room of the late Dr. David W. Finlay.

SMALL-POX IN ENGLAND AND WALES.—Eighty-nine cases of small-pox were notified in the sanitary districts of England and Wales during the week ended Dec. 15th, the counties affected being Derbyshire, Gloucestershire, Middlesex (Wood Green), Notts, and Anglesey (Amlwch).

WE regret to announce the death, on Dec. 21st in Dublin, of Sir Lambert Ormsby, a late President of the Royal College of Surgeons in Ireland, who held the rank of Lieut.-Colonel as Consulting Surgeon to the New Zealand Expeditionary Force.

CHEAPER INSULIN.—Messrs. Burroughs, Wellcome, and Co. announce that on and after Jan. 1st, 1924, insulin will be supplied by them at the reduced price of 12*s.* 6*d.* per phial containing 100 units (10 doses) in 5 c.cm. A similar announcement by Messrs. Allen and Hanburys and the British Drug Houses, Ltd., was noted in our columns last week.

WELSH NATIONAL SCHOOL OF MEDICINE.—The Board of Trustees of the Rockefeller Foundation at their meeting last week agreed to make a donation of £14,000 to assist in the development of the medical unit of the school. The money is to be devoted to the building of laboratories, the provision of part of the initial equipment, and the improvement of clinical facilities for the medical unit at the Cardiff Royal Infirmary.

METROPOLITAN HOSPITAL SUNDAY FUND.—The annual meeting of this Fund was held at the Mansion House under the presidency of the Lord Mayor of London on Dec. 19th, when the report showed that the collection for the year amounted to £93,892, or £6997 less than the previous year's total. The collections in the places of worship amounted to £43,167, or £5449 less than in 1922. Donations also showed a decrease. Hospital Sunday, 1924, was fixed for June 22nd.

REMUNERATION OF INSURANCE PRACTITIONERS.—Meetings of the Court of Inquiry have been arranged for Friday, Jan. 4th, and Monday and Tuesday, Jan. 7th and 8th, at 10.30 A.M., at the Ministry of Health. These meetings will be open to the public and the press. The Court will hold such further meetings as may be necessary. Approved societies wishing to submit evidence to the Court are asked to communicate with the secretary, Mr. R. H. Crooke, Ministry of Health, Whitehall, S.W. 1, enclosing a statement of the nature of the evidence which they wish to give.

MENTAL AFTER-CARE ASSOCIATION.—This Association for poor persons convalescent or recovered from institutions for the insane is urgently in need of funds to carry on and extend the work. Last year over 944 persons were assisted, the majority of whom have done well. The prevention of relapse is one of the chief objects of the Association. Contributions will be gratefully received by the secretary, Miss Vickers, Church House, Dean's Yard, Westminster, London, S.W.

QUEEN'S UNIVERSITY CLUB, LONDON.—A dinner of the club, followed by a musical programme and dance, was held on the evening of Dec. 13th at the Criterion Restaurant, Piccadilly. The members and guests, of whom there were over 100 present, were received by Dr. and Mrs. J. J. Redfern, of Croydon. Membership, without nomination, was declared open to those eligible as past and present students of Queen's University, Belfast, on payment of entrance fee and subscription before March 1st, 1924, to the Hon. Treasurer, Mr. R. A. Kerr, 17, Wimpole-street, London, W. Full particulars may be obtained from the Hon. Secs., Mr. W. McK. H. McCullagh, 152, Harley-street, W., and Dr. E. G. B. Calvert, 17, Wimpole-street.

NORTH-WEST OF ENGLAND OBSTETRICAL SOCIETY.—The Presidential address to the Society was delivered by Prof. Blair Bell, in the rooms of the Liverpool Medical Institution on Dec. 20th last. The subject was Investigations into the Use of Lead in the Treatment of Malignant Disease, and was dealt with from its chemical, biological, and pathological aspects. Prof. Blair Bell told how his attention had been drawn to the possibilities of lead in this direction from a consideration of the action of the metal upon the chorion epithelium of the young embryo, a tissue which he regarded as a half-way stage between normal and malignant growth. But lead poisons not only chorion epithelium but also testis, ovary and nerve tissues, all being structures rich in phosphatide substances. The discovery that malignant growths were rich in phosphatides in proportion to their activity held out the hope that they too might be vulnerable. With the help of an able and distinguished band of colleagues, Prof. Blair Bell set himself to work out exactly the biological and toxic properties of lead, and certain new and valuable facts were discovered. The effect on the heart's action, the interference with kidney function, and the changes in the red blood cells were carefully studied in their earliest phases, with corresponding advantage to the clinician in enabling him to gauge his doses with safety. Particular stress was laid on punctate basophilia in the red cells and diminution in the amount of the urine. With increasing knowledge, toxic symptons were becoming infrequent. The chemistry of the interaction of lead salts and the phosphatides was a difficult and complicated subject, and the effect of lead on pure lecithin, for instance, very hard to estimate. The evidence went to show that the mixed phosphatides found in the body were precipitated. The actual preparation of lead employed was a colloidal solution of lead stabilised by the addition of calcium. In practice this is injected intravenously, but it is hoped that a compound with cod-liver oil, used intramuscularly, may prove an efficient substitute. Previous to the meeting a few cases had been shown of inoperable cases of malignant disease, spheroidal-cell cancer of the breast, sarcoma with almost complete destruction of the scapula, and others, all apparently cured.

MEDICAL SOCIETY OF CLIMATOLOGY AND HYGIENE OF THE FRENCH RIVIERA.—The annual banquet was held at Nice on Dec. 16th and was attended by a large number of doctors practising in the district. Dr. M. Faure (Nice) urged the importance of giving publicity to the beneficial effects of the climate of the Riviera as opposed to exaggerated accounts of the available amusements. He pressed the need of attempting the extermination of flies and mosquitoes in order to extend the popularity of the Riviera into the summer, and instanced the success of the methods applied elsewhere. Dr. Borrel, of Strasbourg, gave a striking description of the good results of such methods in that city. Dr. Samways, of Mentone, contrasted French and English ways of improvements. The French ideals soared too high and often failed in their attainment from their sheer immensity, whereas the English preferred to begin more modestly and achieve something definite, extending their plans as success followed.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, Dec. 31st.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2.30 P.M., Dr. Saunders: Medical Wards.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Department. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. 3 P.M., Dr. Pernet: Skin Department.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Department. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

CLAUSEN, R. J., M.B., B.S. Lond., has been appointed Anæsthetist to Queen Mary's Hospital for the East-End, Stratford, E.

COLEMAN, C. J., M.D. Camb., D.P.H., Medical Officer of Health to the Holland, Lincs, County Council.

GALLOWAY, R. L., M.B., Ch.B. Edin., Anæsthetist at the Salford Royal Hospital.

GRANT, MARJORIE A., M.B., Ch.B. Manch., Assistant School Medical Officer for Stockport.

POPE, H. B. M.R.C.S., L.R.C.P. Lond., Honorary Radiologist to Leeds Public Dispensary.

RENWICK, GORDON, M.B., Ch.M. Sydney, Assistant Honorary Surgeon to the Royal Eye Hospital, Manchester.

RUSSELL, G. HERBERT H., L.D.S., Honorary Dental Surgeon to Leeds Public Dispensary.

SPINKS, A. F. G., M.D., Honorary Physician, Maternity and Child Welfare, Princess Mary Maternity Hospital, Newcastle-upon-Tyne.

THOMPSON, G. K., M.B., Ch.B. Viet., to be Certifying Surgeon under the Factory and Workshop Acts for Sedbergh.

Jessop Hospital for Women, Sheffield: HALL, R. J. B., M.B., Ch.B. N.Z., Senior Resident Officer; FAWCETT, A. W., M.B., Ch.B. Edin., and VICKERY, C. E., M.B., C.M. Sydney, Assistant House Surgeons.

Manchester Royal Infirmary: MAY-ATKINSON, Mrs. KATE KING, M.B., Ch.B. Manch., Assistant Medical Officer to the Massage and Electrical Department; BRYCE, A. G., M.D., F.R.C.S. Eng., Assistant Resident Surgical Officer; LUND, J. K., M.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Manch., Assistant Medical Officer.

University of Sheffield: MORRELL, R. A., M.R.C.S., L.R.C.P. Lond., Lecturer in Radiology; WILKINSON, G., M.B., B.C. Camb., F.R.C.S. Eng., Lecturer in the History of Medicine; SKERRITT, J. H., L.D.S. Eng., Lecturer on Operative Dental Surgery; BARRON, D. C., M.D., Ch.B. Edin., Assistant Lecturer in Medicine.

Vacancies.

For further information refer to the advertisement columns.

Barnet, Wellhouse Hospital.—Asst. Res. M.O. £150.
Bournemouth, Royal Victoria and West Hants Hospital.—Res. H.S. £150.
Bradford Children's Hospital.—Hon. Asst. S.
City of London and East London Dispensary, 40, Wilson-street, Finsbury-square, E.C. 2.—Asst. Pharmacist. £200.
Galloway Royal Infirmary.—Jun. Res. M.O. £125.
General Nursing Council for England and Wales, 12, York Gate, Regent's Park, N.W. 1.—Examiners.
Hospital for Sick Children, Great Ormond-street, W.C.—Biochemist. £600. Res. Med. Supt. £300.
Hospital for Tropical Diseases, Endsleigh-gardens, N.W. 1.—H.P. £150.
Liverpool, Royal Southern Hospital.—Hon. M.O. Electro-therapeutic, &c., Dept., and Hon. M.O. Electro-cardiographic Dept.
Middleton-in-Wharfedale Sanatorium, near Ilkley.—Asst. Res. M.O. £350.
Nottingham Children's Hospital.—Res. H.S. £150.
Notts County Mental Hospital, Radcliffe-on-Trent.—A.M.O. £400.
Orkney, Parish of Eday.—M.O.
Reading, Royal Berkshire Hospital.—H.P. Also Third H.S. Each £150.
Royal Army Medical Corps.—Commissions.
St. Mary's Hospital, London, W. 2.—Med. Supt. £400.
Sheffield Royal Hospital.—Cas. O. £150.
Union of South Africa, University of the Witwatersrand.—Senior Lecturer in Anatomy. £450.
Warwick County and County Borough of Coventry Joint Mental Hospital.—Med. Supt. £1000.
Westminster Hospital.—S. and Ophth. S.; also Asst. Ophth. S.

Births, Marriages, and Deaths.

BIRTHS.

BOURKE.—On Nov. 22nd, at Bhagalpur, India, the wife of Captain U. J. Bourke, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., I.M.S., of a daughter.
MACLEOD.—On Dec. 20th, at Lexham-gardens, W. 8, to May Eleanor, wife of Captain D. N. Macleod, M.B., B.Ch. Camb., R.A.M.C., of a son.
PELLOW.—On Dec. 17th, at The Hook, Kingsclere, Newbury, the wife of Dr. Pellow, of a daughter.
SMYTHE.—On Dec. 18th, at Dunkeld, St. Cross, Winchester, the wife of Gerald Smythe, M.D., of a daughter.

MARRIAGES.

BULLOCH—BAKER.—On Dec. 18th, at St. Augustine's Church, Queen's Gate, William Bulloch, M.D., F.R.S., LL.D., Goldsmiths' Company, Professor of Bacteriology in the University of London, to Irene Adelaide (*née* Peyman), widow of Alfred Augustus Baker.
CHEYNE—BAYLEY.—On Dec. 15th, at the Parish Church, Stenton, W. Hunter Watson Cheyne, M.B., to Grizel, elder daughter of Mr. and Mrs. I. F. Bayley, Halls, Dunbar.
PLACE—TURNER.—On Dec. 22nd, at St. Margaret's Church, Burnage, Thomas Byron Place, junr., L.D.S., eldest son of Thomas Byron Place, L.D.S., of Crewe, to Mary Turner, M.B., Ch.B., D.P.H., eldest daughter of the late Martin and Amy Turner, of Manchester.

DEATHS.

BROWNE.—On Dec. 19th, at his residence, Lismore, Windsor-avenue, Belfast, Sir John Walton Browne, M.D., LL.D.
CHAPPEL.—On Dec. 15th, at Clevedon, Altrincham, George Pester Chappel, M.D.
LOVELL.—On Dec. 16th, at Ashburnham-road, Hastings, Walter Frederick Lovell, M.R.C.S., aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

MEDICAL AND SANITARY WORK WITH THE BURMA CORPORATION.

BY J. P. CULLEN, M.D. LOND., D.P.H.,
MEDICAL OFFICER TO THE BURMA CORPORATION, NAMTU, NORTH SHAN STATES, BURMA.

MEDICAL and sanitary work undertaken by private companies and corporations in outposts of the Empire is little heard of by the public at large. The latter labour under the impression that such companies exist solely for the benefit of shareholders, and have no other aim than that of paying dividends, and some account of the work of the Burma Corporation in other fields than those appertaining to the extraction of silver and lead from what is possibly the richest silver-lead proposition in the world may be of interest.

Geographical and Climatic Features of the District.

The Corporation's areas, situated in the northern Shan States of Burma, on the boundaries of the tropical zone, are, roughly speaking, 600 miles north of the port of Rangoon, and some 50–60 miles from the Chinese province of Yunnan, which supplies a large proportion of the native labour employed. Namtu, the headquarters, lies in the valley of the Namtu river, at an altitude of 1750 feet above sea-level. The other centres of activity are scattered partly along the main line of the Burma railways and partly along the Corporation-owned branch line, with its terminus at Bawdwin silver-lead mine. Over a large area of country the Burma Corporation attends to the medical and sanitary requirements of about 20,000 inhabitants, comprising Europeans and natives of all descriptions and colour. Taken as a whole, the climatic conditions of this area are not unfavourable; but Bawdwin, for example, situated at an altitude of 3000 feet, is less trying than Namtu at 1750 feet above sea-level. The monsoon season starts about May, and in the early days the combination of heat and moisture creates a certain amount of lassitude which passes off with the continued rainfall. The invigorating cold weather from November to March supplies the necessary stimulus for the succeeding hot months. The rainfall averages 60–70 inches per annum.

Public Health in General.

The European staff of the Corporation are accommodated in wooden bungalows, some of which are mosquito-netted. Electric light and water are laid on to each house, and while the majority are provided with a conservancy system of sewage disposal, some are connected up with small septic tanks. With an increased water-supply all the houses will probably soon be on a water-carriage system, and one of the most objectionable and insanitary features of Indian life will thus be removed. Accommodation for native employees varies from stone barracks for the coolie class of worker to houses built of wooden framework with matting walls and galvanised iron roofs for the better class. These houses are provided with pit or pail latrines, the number of which are calculated according to the population using them.

Water-supply.—Namtu at present obtains its water-supply from surface springs. The water thus obtained is open to the objection that it may be contaminated, though owing to the remoteness of human habitations such risk is probably slight. A greater objection is its hardness, which, besides causing trouble owing to deposit of lime salts in the reservoir pipe lines, has been shown to be a cause of diarrhœa, owing to the large proportion of magnesium sulphate derived from a dolomite formation. A new water-supply tapped at its source, and capable of yielding 190,000 gallons per 24 hours, and giving on a basis of 40 gallons per head a sufficient supply for a population of 4000–5000 people is now under construction. At Bawdwin mine and the other centres the water-supply is free from any risk of contamination.

Hospital Accommodation.—Infectious Diseases.

The medical staff comprises eight doctors, five being stationed at Namtu and the remainder at outlying stations. At Namtu the sanitary staff comprises two sanitary inspectors and 92 sweepers, at Bawdwin one sanitary inspector and 27 sweepers, and at the other centres in proportion to their requirements. All the sanitary inspectors hold the certificates granted by the Indian Boards of Examiners, know the native habits, and do their work efficiently and tactfully.

The Corporation's main hospital, reserved for Asiatic and Eurasian employees, and also subserving the large Government areas of Panghai and Ehaung, can accommodate 84 patients. It was opened in April, 1923, and comprises

(1) an administrative block containing offices for the chief medical officer and his chief assistant, an X ray room (with apparatus provided by Messrs. Watson and Sons, London), and a pathological laboratory equipped with microscopes, dark-ground illuminating apparatus, Cambridge rocking microtome, Garrow's agglutinometer stains and reagents, &c.; (2) medical and surgical wards and dispensary; and (3) a well-equipped operating theatre. In addition, there is a small separate European hospital of four male wards and one female ward. In the near future it is intended to amalgamate these two hospitals in order to increase efficiency and lessen cost. Outlying districts of importance contain small hospitals capable of accommodating three to four patients until such time as they can be safely transferred by rail to the central hospital at Namtu.

Epidemics have been carefully considered by the Corporation and its sanitary advisers; the conclusion finally arrived at has been the building of a temporary hospital capable of rapid enlargement at a spot five miles out of Namtu, the policy being to provide accommodation which can be rapidly enlarged by the engineering staff in case of emergency, which can be destroyed after use, and which, being of a temporary nature, will require little upkeep and not fall into ruin from neglect for a period of years.

Effect of Foregoing Measures on the Health of the Population.

If, as has been stated, "the enteric fever mortality is the best test of sanitary condition, caused, as it is, by specific fæcal contamination of soil and water," then the sanitary state of the Burma Corporation is satisfactory, for no case of enteric has occurred during the past year. Cholera, which swept these valleys in 1918 and has again been reported in the northern Shan States, has not visited these parts for five years. Plague occurred in four cases in 1922. Two recovered, one after excision of a bubo in the groin, the other after intravenous injection of iodine. All cases were verified by bacteriological findings, and contacts were inoculated and kept under surveillance. The most effective measures dealing with the rat pest were found to be periodical rat drives. Trappings and poisoning were found unsatisfactory. No case of small-pox has occurred during the past three years.

Peculiar and Prevalent Diseases.

Of prevalent diseases, malaria undoubtedly holds the chief place, and the statistics are swollen to large figures when the native population is included. The natives are recruited not for their mental acquirements but for their capacity for hard manual work; they only visit hospital when too ill to work. During 1922, 17,687 cases of malaria attended the various hospitals and dispensaries, with 100 deaths, or a mortality of 0·5 per cent. Amongst the European population only 22 cases were admitted to hospital, with no deaths. One case of blackwater fever was recorded in an Indian; he had previously suffered from the disease, and recovered. Repeated blood examinations failed to discover the malarial parasite in this case. An examination of the urinary sediment revealed, however, short chains of streptococci. During the year popular lectures, including demonstrations of the malaria parasite, of anophelene and culex larvæ, and of children with greatly enlarged spleens were given. Two large swamps were drained, and mosquito brigades were organised. Malarial prevention is, however, an individual as well as a communal problem, and with an ignorant population progress is slow.

Relapsing Fever.—During the year 1922, 13 cases with one death occurred, the patient in this instance being in a very debilitated state when admitted to hospital. All the cases were met with among Chinese coolies from Yunnan, who arrive badly infested with lice. A delousing apparatus has been set up at Bawdwin, and each batch of coolies as it arrives is now deloused. The procedure was unpopular at first, but the Chinese, handled with tact, have come to realise the benefits of the method, and now submit readily. Medical treatment of the active disease consists in one or at the most two injections of neo-salvarsan. That relapsing fever can assume the nature of an epidemic, accompanied by a high mortality and giving grave anxiety to health authorities, is shown by the report on relapsing fever in the Madras Presidency in THE LANCET of August 4th, 1923.

Beri-beri.—This disease has been met with among the Chinese labourers. During 1922, 68 cases with 19 deaths occurred. Most of the cases were sporadic, but in one instance of 19 coolies attacked within a few days six died. On investigation it was found that the men had contracted with another Chinaman to feed them, the sole article of diet being polished rice. Samples of this rice, on analysis for phosphorus content, gave figures near or below the limit fixed by legislation. An improvement of the contractor's diet scale and a lessening of his profits followed.

Disease Traceable to Work in Mines.

Miners' Phthisis.—The Bawdwin mine is, in mining language, a "wet mine" and therefore free from dust. No case of pneumokoniosis or miners' phthisis occurred in it during 1922. The prevalence of pulmonary tuberculosis in Burma and the northern Shan States is a matter, however, that sooner or later will require investigation.

Ankylostomiasis.—Only two cases of this disease were met with in 1922, the worm, of the usual Eastern type, being discovered during a routine examination of fæces and not responsible for the patients' ill-health.

Plumbism.—This condition gave rise to much discussion during 1922. The difficulty of preventive measures for use in dealing with an ignorant class of labour was finally solved by the erection of a gigantic flue, the largest in the world, at a cost of ten lakhs of rupees. All fumes from the smelter are now taken up this flue by powerful suction apparatus instead of polluting the atmosphere at the mouths of the furnaces.

Venereal Disease is rampant in the tropics and Namtu is no exception to the general rule. No European should be allowed to come out east without plain warning of the risks incurred by promiscuous sexual intercourse, and he should be instructed in early treatment as carried out in the army. Much misery may be saved by a little plain talking. A knowledge of the prevalence of V.D. sometimes leads to curious errors in diagnosis, and salvarsan and its derivatives are still too frequently employed as diagnostic agents. Two cases of quaternary syphilis in natives came under observation during the past year; one was of well-marked tabes following on insufficient doses of 914 (four injections), the other of thoracic aneurysm, showing post mortem well-marked naked-eye signs of syphilitic aortitis, and on section a gummatous mesaortitis.

Vital Statistics.

Whilst no satisfactory system of birth and death registration is in vogue throughout the area and the figure of 20,000 for the population is open to the criticisms attached to all floating populations, a few statistics are appended which may be of interest. The general or crude death-rate is estimated at 17·5 per 1000, as compared with 21·45 for the province (1922 report), and over 30 for British India as a whole. Malaria claimed a death-rate of 5 per 1000, and dysentery 0·75 per 1000. The mortality rate for plague was 0·1 per 1000, as against 0·516 for the whole province.

General Comments.

For such work as has been accomplished the sole credit lies with the management and the board of directors of the Burma Corporation, who have spared no trouble or expense. Much still remains to be done—e.g., the problems of a census of vital statistics, prompt notification of epidemics to a central authority, prompt distribution of the information so obtained, the ferreting out of latent foci of disease in out-of-the-way native villages, stricter vaccination, Government encouragement of research, and the opening up of a very rich country in order to provide the necessary financial support. Locally, the difficulty which confronted munition workers during the war—that of retaining maximum efficiency with maintenance of bodily health—faces us and will no doubt be tackled soon. A constant problem is to diagnose correctly the first case of any epidemic disease, the occurrence of which would entail a serious loss of revenue to the Government and Corporation.

ROYAL INSTITUTION DISCOURSES.

BIOLOGICAL sciences are to be well represented in the coming session at the Royal Institution. After Sir William Bragg's Christmas lectures on "The Nature of Things" (which he is naturally treating from the physical standpoint) and the tribute that is to be paid by Prof. H. E. Armstrong to the late Sir James Dewar, the programme of the Friday lectures will be found to have many points of contact with the medical profession. Prof. Hugh MacLean, in his discourse on insulin proposes to show why the previous attempts to isolate it failed. As full a description of its value and mode of application as is compatible with a lay audience will be given, and emphasis will be laid on its toxic action and the consequent need for very strict care in its use. In another discourse Prof. Elliot Smith will expound his views on the evolution of the human brain, emphasising the part played by the cultivation of vision and discussing how the human brain attained its distinctive feature—namely, the power of learning by experimentation, and the power of appreciating and interpreting the meaning of things and events in the outside world. Dr. Jocelyn Thorpe is discussing "Colours, Stains, and Dyes," and will point out how restricted Nature is in her way of forming colours, and how she relies more on physical than chemical means, the reason being that in coloured carbon compounds it is only the unsaturated molecules, which are very liable to change, that exhibit colour phenomena. As illustrations he will take the colours of the butterfly's wing, and of the feathers of many birds which depend on an arrangement of hair-like filaments so set

as to reflect the required colour. Lastly, Sir Frederick Keeble is taking "The Plant Commonwealth and its Government" as his subject, and will deal with the new work that is tending to show the close relation existing between the tissues of plants. As in Sir James Dewar's time, the club rooms of the Institution will be open every Friday evening to members and their guests, for the exhibition of objects of scientific, literary, and artistic interest. Incidentally, the weekly exhibitions held during the sessions are a curious illustration of how ignorant the average Londoner is of his London. Many who attend the Friday lectures are unaware of their existence, and outside professional men of science there are few who realise that the Institution is essentially a club with a scientific and general library comprising some 60,000 volumes as one of its attractions.

CALENDARS AND DIARIES FOR 1924.

A CONVENIENT block calendar for 1924 has been issued by the Anglo-French Drug Co. (238a, Gray's Inn-road, London, W.C. 1.). There is provided for each day throughout the year a sheet of white paper four inches square for written memoranda, and the stiff hinged cover provided preserves the privacy of the notes, and yet by means of a window permits the date to be constantly seen. A certain number are available gratis on application to the company.

BIRTH CONTROL AND THE MINISTRY OF HEALTH.

AT a meeting held on behalf of Walworth Women's Welfare Centre at 43, Upper Grosvenor-street, London, on Dec. 13th, Lord Buckmaster presiding, it was moved by Dr. Elizabeth Sloan Chesser, seconded by Dr. Binnie Dunlop, and resolved, nem. con., that "This meeting represent to the Ministry of Health that it is desirable that no official opposition should be raised to the giving of birth control advice at any welfare centre, the medical officers of which are willing to give such advice."

We understand that the present attitude of the Ministry of Health in regard to birth control is:—

1. That the maternity and infant welfare centre should deal only with the expectant or nursing mother (and infant) and not with the married or unmarried woman contemplating the application of contraceptive methods.

2. That it is not the function of an ante-natal centre to give advice in regard to birth control, and that exceptional cases in which the avoidance of pregnancy seems desirable on medical grounds should be referred for particular advice to a private practitioner or hospital.

A MODIFICATION OF THE RINGLEB CYSTOSCOPE.

THE component parts of this modified cystoscope are: (*a*) The sheath carrying the lamp, and, in the catheterising model, catheter channels with an Albarran lever; (*b*) the telescope; (*c*) the obturator; (*d*) the ball-valved spigot. The examining and catheterising sheaths are similar to those of the Ringleb model, with the important difference that the valve chamber and clapet valve are dispensed with, a simple metal collar with a compression flange taking the place of the former, and the clapet valve being replaced by the ball-valved spigot to be described later.

The advantages claimed for this modification are: 1. A complicated mechanism is replaced by a simple one, which is much less likely to give trouble. 2. The sheath is shortened, with the result that the telescope is correspondingly shorter, thus allowing (for the lens system used in this model) of better definition and brighter illumination. 3. Sterilisation of the instrument is easier, for the valve chamber and clapet valve are apt to collect mucus, blood-clot, &c., in the wiring of the spring and the interstices of the chamber, and to achieve efficient sterilisation of these parts by boiling entails very careful heating of the sheath for fear of damage to the wiring, whereas the ball-valved spigot is readily taken apart and boiled. 4. The cost of production is appreciably diminished. 5. Friction of the clapet-valve against the distal end of the telescope, a potent source of wear and tear, is obviated.

The telescope is provided with the upright and right-sided genito-urinary lens system, a detailed description of which may be found in "The Theory of Optical Instruments," by Elmsley and Swaine. The obturator is a plain, solid, metal rod of the same diameter as the telescope, with a serrated knob at the proximal end to facilitate handling. It fills the space usually occupied by the telescope and is introduced with the sheath into the bladder. The reasons for the addition of an obturator are two-fold. In the first place, it obviates all unnecessary manipulation of the delicate optical component, the latter being introduced only after all the preliminaries have been completed and the bladder is ready for examination; and secondly, the addition of a solid metal rod to the thin sheath gives the latter more weight, a factor facilitating gentle and painless introduction after the manner of a sound.

The ball-valved spigot is composed of two parts screwed together, the distal end being cylindrical and fitting into the proximal opening in the sheath, and the proximal end being olive-shaped externally to take an irrigator or syringe nozzle, as the case may be. A weak, non-corrodible spring presses a metal ball-bearing of appropriate size against the anterior socket. This ball-valve allows the inflow of fluid into the bladder under weak pressure, but effectively prevents any back flow.

The modification described is of especial value in the child's cystoscope.

The instrument is made by the Genito-Urinary Manufacturing Company, of 64, Great Portland-street, London, and is illustrated in their current catalogue.

JOHN ALBAN ANDREWS, *M.C.*, F.R.C.S. Eng.

EXPOSURE TABLE FOR COOLIDGE X RAY TUBES.

A CONVENIENT exposure table in card form for the use of radiologists and others has been issued by Messrs. Watson and Sons (Electro-medical) Ltd. (43, Parker-street, Kingsway, London, W.C. 2). On one side of the card exposures are given for double-coated films, and on the other for X ray plates. Use of this card will help to standardise technique so that the results of separate observers may be made comparable. The exposures are based on a subject of average weight; any considerable variation will necessitate a slight increase or decrease of the exposures given. The cards, which are very highly glazed, will be replaced when damaged or worn free of charge by the makers.

A SCIENTIFIC INVESTIGATION INTO VEGETARIANISM.[1]

THIS book is written in a fine flowing typically French style, and, apart from technical errors, such as the use of the term "hydrates of carbon" for "carbohydrates," is well translated. The book may truly be described as full of meat, but it is meat rather overdone. With many of the author's arguments we feel bound to agree, and these are calculated to do good. But certain other arguments are less convincing—for example, "Every objection disappears before these three laws which sum up the most important teachings of general physiology: (1) a food is a substance suited for transmitting matter and cosmic energy to animal organisms, which are incapable of profiting by their contact with the common environment to gather energy therefrom; (2) vegetables alone, being supplied with chlorophyll, are capable of creating foods and food energy, &c. . . . . they alone can renew the stock of matter and energy on which the animals draw; (3) in a word, the true food, in its pure source, is inevitably vegetable."

Surely, the evils of meat eating (or "necrophagy," as the author calls it) are rather quantitative than qualitative. There is excellent chemical evidence that meat supplies the necessary amino-acids far more readily than do plant proteins. Prof. Lefèvre himself is no mean athlete, as is clear from his description of his mountaineering exploits. He appears to be one of those who can utilise plant proteins profitably, and if he is better on a "vegetalian" diet, he should certainly stick to it.

X. Y. Z., whose disgust we share, has omitted to enclose his card.

St. Paul's Hospital.—Dr. Leonard Myer informs us that the attendances at St. Paul's Hospital for Skin and Genito-Urinary Diseases are 60,000 a year for venereal diseases. The figure 20,000 mentioned last week (p. 1353) applied to the last year at the old hospital, with its limited accommodation.

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[1] By Prof. Jules Lefèvre, Chevalier de la Légion d'Honneur, Lauréat de l'Institut et de la Société de Biologie, Professeur au Lycée Pasteur. (Translation by Fred. Rothwell.) London: John Bale, Sons and Danielsson, Ltd. 1923. Pp. 189. *7s. 6d.*

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"CHEMISTS TO A NATION"

WIDESPREAD ACTIVITIES OF "BOOTS THE CHEMISTS."

A GREAT MANUFACTURING, DISTRIBUTING AND RETAILING CONCERN

BY HERBERT HILL.

HACKNEYED as it may be, the old saw "Great oaks from little acorns grow" has nevertheless a triteness about it and a ring so typically British, that it seems particularly appropriate when used to epitomise the birth and phenomenal growth of that great organisation known practically throughout the length and breadth of the land as "Boots The Chemists."

When, in the early seventies, half a century ago, the young lad, Jesse Boot, took over his dead father's little shop for the sale of herbs, situate in the unpretentious thoroughfare of Goose Gate, in the centre of the City of Nottingham, the acorn was planted which, in due course, was to take root and grow to be one of the largest and most powerful retail shop-owning concerns in the world.

A Many-sided Organisation.

But, although it is as owners of attractive shops wherein are retailed drugs and medicines, and toilet and personal requisites, that the firm of Boots the Chemists is so widely known and patronised by the public, the concern is, as a matter of fact, much more than a company of shopkeepers. The widespread network of retail chemists' shops has behind it a vigorous many-sided organisation at first glance bewildering in its complexity, but which, upon a closer scrutiny, very quickly demonstrates a truly remarkable efficiency.

Before proceeding in any way to enlarge upon those activities of the Boots organisation which do not directly evidence themselves to the millions of people using its shops, it may be as well to state that the undertaking comprises a group of six joint stock companies. They are:—

Boots Pure Drug Company, Ltd.
Boots Cash Chemists (Eastern), Ltd.
Boots Cash Chemists (Lancashire), Ltd.
Boots Cash Chemists (Northern), Ltd.
Boots Cash Chemists (Southern), Ltd.
Boots Cash Chemists (Western), Ltd.

Five Millions of Capital—40,000 Shareholders.

The total capitalisation of these six companies is £5,000,000, and the shares are held by no less than 40,000 shareholders domiciled all over the country.

The original, and still the parent concern, is Boots Pure Drug Company, Ltd., whose very important function is the buying of all raw material and its manufacture and distribution to the hundreds of branches owned by the five subsidiary retailing companies—those distinctive shops which are so familiar a feature of the principal shopping thoroughfares of nearly every town or city of any size in the Kingdom.

The Head Offices of all the six companies are at Nottingham, within a stone's throw, so to speak, of the site upon which stood the original little shop which was to be the forerunner of the present-day Boots organisation, and the whole of the administrative work of the business is directed from that centre.

More than 900 people are engaged on the administrative side, and a vast amount of detail work is performed by them. Exhaustive digests, dissections, and costings are undertaken, and thus a very close watch is kept on all such matters as manufacturing costs of production, stocks, records, branch finance, and so on.

Activities and Assets.

That such a large clerical staff is necessary will be easily understood once an appreciation of the ramifications and magnitude of the organisation behind the retail distribution is gained. Some of its activities and assets may be briefly set out as follows:—

First of all, in addition to running nearly 700 thoroughly up-to-date chemists' shops, the Boots concern manufactures on a huge scale all kinds of medicinal and pharmaceutical preparations, for which purpose it possesses one of the most extensive and up-to-date plants in the world. No less than 35 per cent. of the great volume of pharmaceutical products sold over the counters of the Boots shops are manufactured by the organisation itself.

It has extensive research and analytical laboratories under the most highly skilled technicians. And, supplementing the important part these laboratories play in connection with the demands of the organisation of which they form so essential a unit (some 70,000 analyses were undertaken last year), research work which has proved of great national value is carried on.

It owns printing works giving employment to 400 people. These printing works are a model of their kind, and are frequently visited by people from all over the country interested in printing.

It has a plant for the manufacture of extract of malt with cod-liver oil with a capacity of 500 tons per annum.

It operates a soap-works and a perfume distillery, where bath and other fancy soaps and perfumes of all varieties are turned out in large bulk.

It runs a mineral-water factory, and throughout the Midlands in particular Boots mineral waters are widely known.

It is the largest user of Burroughs Adding Machines in the Kingdom.

It runs a bookbindery and a picture-framing factory.

It has a power-house with a consumption of 400 tons of coal a week.

It has a carpentry, joinery and cabinet-making works, turning out showcases, desks, counters, chairs, office furniture and equipment and other internal fittings, as well as designing and making all the shop-fronts required by the subsidiary companies.

It sells well over half a million books in the course of a year, thus dispensing much "medicine for the soul," as well as for the body.

It has first-aid rooms, an up-to-date surgery and convalescent and holiday homes for the benefit of the employees.

It has a window display department for inculcating the art of window dressing on the approved "Boots" lines, and lastly its activities cover the running of a school.

One might go on almost ad infinitum cataloguing the activities and possessions of this versatile concern, but enough has been said to indicate, at least to some extent, the diverse operations embraced by the Boots companies in their endeavour to give to the public a service which shall be the last word in the matter of supplying pure drugs and chemicals, medicinal and toilet preparations and the various side-lines allied thereto.

Nottingham the Headquarters.

All the laboratories, factories, warehouses and workshops enumerated above (and the list is by no means exhaustive) are situated at Nottingham. The floor space of the various buildings approximates 1,055,944 superficial feet, and they stand on some 14¼ acres of land. To make a thorough inspection of them all would call for no mean expenditure of physical effort, but even a quick run through is sufficient to impress one with the wonderful versatility of the concern, and to compel a tribute to the genius which could envisage such an undertaking and to the brains and willing service which carry it ceaselessly forward.

Willing, or perhaps one should rather say, enthusiastic service, seems, indeed, to be the keynote which energises the whole of the staff one meets at Nottingham. Again and again as one wends one's way from one building to another some particularly ingenious device or clever piece of machinery stands out to catch the eye, but over and above all one senses throughout the entire organisation that spirit of enthusiastic service which goes far to explain the wonderful success of the Boots undertaking.

BOOTS WORKS, ISLAND STREET, NOTTINGHAM, FOR THE MANUFACTURE OF FINE CHEMICALS.

Up-to-date Working Conditions.

Then, too, one cannot fail to note the spaciousness, cleanliness, and airiness pervading all the many separate buildings. Unquestionably the employees work under the most favourable conditions, and this congenial atmosphere must do much to lessen the possibilities of their work assuming the dull routine of a monotonous task.

And to realise that many of the individual tasks might well become monotonous is but to watch, say, the automatic bottling machines working as rapidly as the attendant girl can work a lever. In many of these mechanical contrivances the output capacity of the machine seems to be limited only by the physical capacity of the human who operates it. It is, therefore, to the advantage of the employer to see that the employee works in the most attractive surroundings. Mechanical genius has made such strides as to eliminate largely the human interest of the workman in his work, and the psychological effects of this can only be countered by ensuring that the environment in which the more or less automatic task is performed is of the best.

Model Shops and Ideal Factories.

This the Boots organisation wholeheartedly attempts to do. Just as the Boots retail shops are models of what such shops should be, so the Boots laboratories, factories and workshops appear to be as near the ideal as it is as yet possible to get. Boots obviously take a pride in their workpeople, in their plant and machinery and in their buildings. Industrial psychology in all its phases is given the most careful study. Nothing seems to be left undone in regard to the comfort and well-being of their employees; the buildings and premises are constantly undergoing extension and improvement, and the plant and machinery is continually receiving additions and renewals.

Machine Made Pills.

Where there is such an infinite variety of mechanical appliances in use it is not easy to single out any for particular mention, but the process of pill making by machinery would probably appeal most to nine out of ten visitors to the factories.

One sees the pill mass worked up in a capacious mechanical mixer, then automatically rolled into strips, and then again automatically rolled into the conventional little globules. These globules are mechanically sorted for size, and "under sizes" and "over sizes" are automatically rejected and go back again into the pill mass for the automatic process to be repeated.

The coating of pills is done by a device which holds the individual pill by a vacuum, immerses one-half in the coating solution, and then performs a similar operation with the other half of the pill.

One sees also the homely but necessary Seidlitz powder and the morning draught of Erasmus Wills' Salts mechanically compounded and mixed in huge bulk in drums of wonderful capacity and marvellous cleanliness, then mechanically weighed by machines with a daily capacity of some 30,000 quarter-pound tins, packed, and so via the despatch department to the shop counter.

One strolls further and sees vaseline being filled into pots by machinery at the rate of over 30,000 pots during the working day, and emulsions, extracts, mixtures, powders, lozenges and pastilles, and many other preparations all being similarly dealt with in an expeditious manner by efficient machinery, supplemented by equally efficient human aid. These

> herbs and other country messes
> which the neat-handed Phyllis dresses

are, indeed, handled with scrupulous cleanliness and meticulous exactitude by the many hundreds of white overalled girls throughout the various departments.

The manufacture of scents of all varieties and descriptions is another important side of the business. The still used in the manufacture of Eau-de-Cologne has a capacity of 130 gallons. There are also 100-gallon measuring tanks and 135 storage tanks with a capacity of 100 gallons each. This department, in addition, manufactures many varieties of other scents and hair oils, and the fact that the contents are insured for £100,000 gives some idea of the magnitude of the output.

Boots also produce in vast quantities face and talcum powders, tooth pastes, cold creams, vanishing creams and similar products, and it is extremely interesting to watch the careful supervision of all the different phases in the manufacture of these various toilet preparations. An instance of this care in production is the provision made to ensure that all complexion powders are of an impalpable fineness suitable for the most delicate skin. This task is achieved by silk bolting machines and rotary sifters, while the necessary colour grading is performed with the help of machines called edge runners. In the case of tooth pastes the methods adopted are as equally efficient, and so great is the output that manufacture is carried out in batches of half a ton.

Some idea of the magnitude of the output from the Nottingham Laboratories and Factories can be gathered from the fact that over 1¼ million packages are dealt with every week, and 800 tons of Salines, 500 tons of Official Galenicals, 500 tons of Malt Extract and Malt and Oil, 273,000 gallons of Wet Preparations, Emulsions, etc., in the course of a year.

The packing of this great bulk ready for retail distribution requires some 46 millions of labels, handbills, printed wrappers and linings, ten million cartons, twelve and a half million corks, twenty million bottles and jars, fifteen million tins and five tons of string.

Purity and Accuracy Tests.

Reference has already been made to the very large number of analyses performed in the analytical laboratories in the course of a year, and this point will bear further emphasis. Boots leave no stone unturned to ensure the purity and efficiency of all their products. Every package of raw material before being taken into stock is subjected to analysis to ensure that it is what it purports to be, and the material cannot be used until a certificate has been given by the chief analyst. Further, all manufactured products are analysed at various stages of preparation, and when completed are again subject to close scrutiny during packeting or bottling.

Boots technical experts meet regularly in the "Formula Committee" (which is specially charged with the duty of taking care of the quality of Boots products) and together scrutinise most carefully the formulas, the processes of manufacture, analytical standards, and labels with the directions for use, etc., with the dual object of ensuring that Boots products are of the finest possible quality and that they are presented to the public with adequate instructions for their safe use in the home.

A National Asset.

As already mentioned, in the course of a year the analytical laboratories make some 70,000 analyses, and it is in these analytical laboratories that Boots possess a wonderfully efficient instrument from which the public reaps a great benefit. Not only is an exceptionally high standard of purity guaranteed in all pharmaceutical products to the advantage of the individual purchasers in the Boots shops, but the experimental work which is continually going on is of incalculable value to the nation at large. In the best sense of the word the Boots laboratories are a National asset.

The founder of the firm, Sir Jesse Boot, was a visionary in the matter of the scientific control of pharmaceutical manufacture, and it is simple historical fact that he established a laboratory for the analytical control of the products of his firm at a time when the authoritative standards of the British Pharmacopœia were what we now think perfunctory, and when practically no other house in the trade considered such a safeguard either necessary or financially possible.

Boots War Record.

This steadfast faith in the necessity of a scientific basis for pharmaceutical manufacture stood the firm in good stead when, in the early days of the war, the manufacture of chemicals heretofore never produced in England was undertaken with striking success. The firm became the pioneer in this country of large-scale production of fine pharmaceutical chemicals.

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EDINBURGH.

High St & Pelham St.
NOTTINGHAM.

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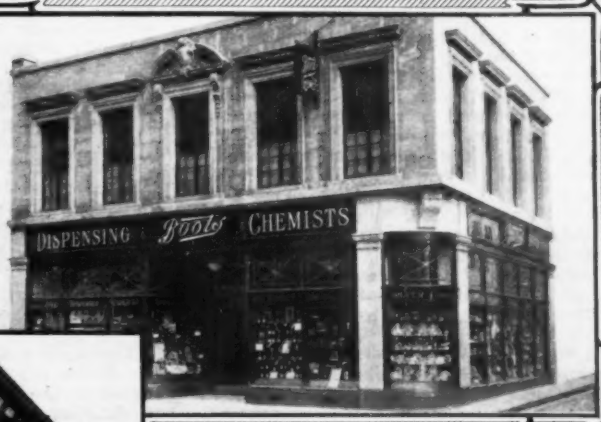

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LIVERPOOL.

182 Regent Street,
LONDON, W.1.

BOOTS PURE DRUG CO. LTD.

The Fine Chemical Works.

The plain tale of the achievements of the Boots organisation during that trying period is a record of remarkable and conspicuous service. In collaboration with the Anti-Gas Department of the Ministry of Munitions it produced the first effective box respirators ever used, and supplied the whole of the chemical granules for filling the respirators used by the British and certain of the Allied Armies during the whole period of the war. In addition the firm filled and supplied upwards of 8,000,000 complete box respirators to the British and Allied Armies. Contemporaneously the manufacture of saccharin was being worked out at the behest of the Sugar Commission, and Boots became, and still are, the largest producers of this useful sweetener in the United Kingdom.

These then novel activities soon called for the services of a laboratory devoted solely to the higher branches of chemical research, the result of which establishment has amply justified the foresight shown. The highly trained personnel soon found themselves hampered in their work by a lack of suitable research chemicals, formerly imported entirely from certain firms specialising in them in Germany, and the problem of a home supply was attacked. So successfully have the research chemists of the firm applied themselves to this task that it has been found possible to publish a list of 800 research chemicals issued by the firm which enjoy increasing popularity in the laboratories of the universities and scientific institutions of the country.

An Improved "Salvarsan."

A further striking indication of the value to the Nation of the work carried on in the Boots Research Laboratories is afforded by the Company's experience in the early days of the war in the matter of Salvarsan. A shortage of Salvarsan had early manifested itself when German supplies were cut off, and as a result of the valuable research work carried out by the company's chemists a licence for the use of enemy patents had been granted to the firm by the Board of Trade.

Not content, however, to be mere copyists, the research staff discovered a much superior product, which, while being at least equally effective as an anti-syphilitic was much less toxic in effect, and could be presented in the form of a solution for easy administration. This preparation, covered by letters patent granted to the Company and called "Stabilarsan," enjoys an increasing sale and is the last word in anti-syphilitic technology.

The newer antiseptics, such as Chloramine T., Proflavine and Acriflavine were produced early in the history of the Chemical works, and such products as aspirin and chloroform are staple manufactures. Fine alkaloids and delicate active principles such as Atropine, Hyoscyamine, Caffeine, Digitalin and Capsaicin are also regular products of the works.

The New Diabetes Remedy.

The most recent instance of the determination of the Boots organisation to maintain its position as leader in the newer therapy is its enterprise in the production of "Insulin," the new remedy for certain forms of diabetes. Intensive research work has resulted in the production of a product of remarkable activity which has undergone clinical tests at one of the most important of the London hospitals for some considerable time past. The good results obtained encourage the hope that we are on the threshold of a revolution in the treatment of this hitherto fatal disease, and the Company is fully alive to the possibilities open to it in virtue of its enlightened view of its responsibilities in face of this great advance in medical science.

DRUG AND DISPENSING DEPARTMENT AT BOOTS THE CHEMISTS' BRANCH, ROYAL EXCHANGE, MANCHESTER.

The firm is one of the very few licensed by the Medical Research Council for the production of this important product, and its set policy is by diligent and intensive research work to retain its proud position in the production of the medicaments of the newer therapeutics.

That it will succeed in its endeavour to give a lead not only in this direction, but also in its declared intention to maintain the honoured traditions of pharmacy, none who come into close contact with the business can for one moment doubt. An executive with vision and foresight, adequate and conservative finance, and a staff of enthusiastic and experienced workers is a triple alliance of indisputable strength.

A 13,000 Staff.

And one is inclined to think that not the least potent factor in the combination is the great reserve of productive energy and good-will provided by the employees of the concern. Approximately 13,000 people are employed by the Boots Companies, and of these over 1,000 are qualified men in charge of the retail shops and of various departments at the manufacturing end of the business. We have already noticed the spirit of enthusiasm which animates all grades of workers at the Nottingham headquarters, and the same esprit de corps is to be found at the branch shops. Instances of long years of service with the firm are frequent, and employees of twenty years' standing are quite numerous. This seems satisfactory enough testimony to the conditions of employment and the interest shown by the executive in the personal welfare of the staff.

The Staff Welfare Movement.

Boots do not render mere lip-service in the matter of staff welfare. Much time and thought is devoted to the relationships between employer and employee, and the Welfare Council forms a most valuable link between the workpeople and executive. Broadly, the welfare activities may be divided into three categories—medical, educational and recreational.

As regards the first of these, provision is made for minor mishaps by first-aid rooms established throughout the factories, each room being in charge of a qualified nurse. In addition there is a central surgery with a doctor, trained nurse, V.A.D. nurse and a masseuse. And further, in order to keep in touch with employees who may fall ill, two trained nurses are employed to visit their homes to offer advice and assistance.

To meet the great need for Holiday and Convalescent Homes at reasonable rates the Company have purchased a large house at Skegness, the popular holiday resort on the East Coast, while a Convalescent Home in North Wales is provided by Boots Health Insurance Society.

Educational and Recreational Facilities.

The educational side of the Welfare Movement provides that all employees between the ages of 14 and 16 may attend four hours per week during work time at the Continuation School, where the training includes English, house management, gymnastics, mathematics and drawing. Selected pupils from the Continuation School are allowed to continue training during work time from 16 to 18. Further, the evening school fees for students attending regularly are refunded by the firm at the close of the session. Other facilities offered include special lectures and day scholarships at the University.

The recreational aspect of the Welfare Movement is particularly active. The firm have provided 11 acres of playing fields, including 18 tennis courts, two bowling greens, skittle alley, two cricket pitches, quoit bed and a putting course. A large pavilion with seven dressing rooms, baths, tea rooms, kitchen, larder and accommodation for a residential caretaker was built last summer.

There is also an institute with billiard room, games room, smoke room and large room for dancing and social gatherings. These were provided by the firm and are under the control of an Institute Committee elected by the employees.

Further, there is a commodious modern Swedish gymnasium with spring floor, complete with the latest equipment. It may be mentioned that this gymnasium is in constant use for day classes in the day Continuation School, and for evening classes for employees. The 42nd Nottingham Troop of Boy Scouts is comprised of members of the firm, the Company assisting by the provision of rooms, camping equipment, band instruments, and so on, while there are two large girls' choirs and a weekly hobbies club. The Welfare Organisation also published "The Beacon," a social magazine for the employees.

In addition to these mentioned activities Boots assume a moral responsibility for the well-being of their employees. Thus should any individual worker find him or herself in difficulties he or she may

SURGICAL DEPARTMENT AT BOOTS THE CHEMISTS' BRANCH, CARDIFF.

A VIEW OF BOOTS SPORTS GROUNDS, LADY BAY, NOTTINGHAM.

make an appeal to the Welfare Council with the certainty that the appeal will receive sympathetic consideration, and assistance be forthcoming if the circumstances warrant it.

An Entente Cordiale.

It will therefore be seen that the relationships between the Boots Companies and their employees are far from being soulless transactions in the buying and selling of labour. The management on their part seek in every way to create a favourable working atmosphere and recognise that they have other obligations to their workpeople beyond the paying of wages.

On the other hand, the employees respond right well to a treatment which they believe is actuated not so much with the idea of amassing further profits, but is rather the outcome of sane thinking as to what should be the real attitude of an employer toward his workpeople.

The Future of "Boots."

In concluding this survey of the present-day activities of the Boots concern it may perhaps be interesting to look a little ahead and consider what the future has in store for the undertaking.

As a great manufacturing organisation retailing its products directly to the consumer, its chief care would seem to be the ensuring of a market for those products. The manufacturing end of the business may, we think, well be left to take care of itself. Housed as it is in modern buildings, equipped with plenty of efficient plant and served by the best technical advisers and workers, it could speed up production both economically and with little, if any, outlay of capital.

As regards the retailing side of the business, this is equally efficient and elastic, and is capable of expansion along safe and sure lines.

At the present time there are nearly seven hundred branch shops open, and the policy is to endeavour to open one new shop each week. If this rate of expansion were adhered to there would, of course, be a continuous increase in the sale of the Boots products, while the field for the establishment of further branch shops would by no means be fully cultivated for a good many years to come.

The existing branches are well placed throughout the country and vary in size and importance from the small branches in the lesser populated provincial towns employing three or four assistants, to those fine examples of modern-day chemists' shops such as are represented by the Regent-street branch in the West End of London, the Church-street, Liverpool branch, and the Royal Exchange, Manchester establishment, which employ as many as 70 or 80 assistants each.

For one or other class of branch there are yet many openings, and that the directors are keenly alive not only to the possibilities of establishing new branches, but to developing the business of those already existing, is shown by the recent installation at a large number of shops of surgical departments under the supervision of trained nurses. In these surgical departments a full range of appliances, dressings, nursery requisites and so on is available, and this innovation should considerably augment the Company's gross turn-over.

Eighty Million Customers.

Last year the Boots shops catered for some eighty millions of customers, which is practically equivalent to saying that each of the inhabitants of England, Scotland and Wales was served twice in the course of the year. Bearing this factor in mind and contrasting with the figure of 1911, when 38,000,000 customers entered the Boots shops, it will be seen that the business is wonderfully progressive.

With an industrial revival and a consequent appreciation in the spending power of many millions of people, one would expect last year's record to be easily eclipsed. In any case, such is the initiative and energy behind the organisation that one seems quite safe in saying that the "Boots" of to-morrow will not be the "Boots" of to-day. Sane industrial enterprise and solid development and progress are essential to the Nation's welfare, and to those ideals the great "Boots" undertaking will, we may be sure, not fail to contribute substantially in the future.

"Symptoms are the body's mother-tongue."

Cabot's DIFFERENTIAL Diagnosis

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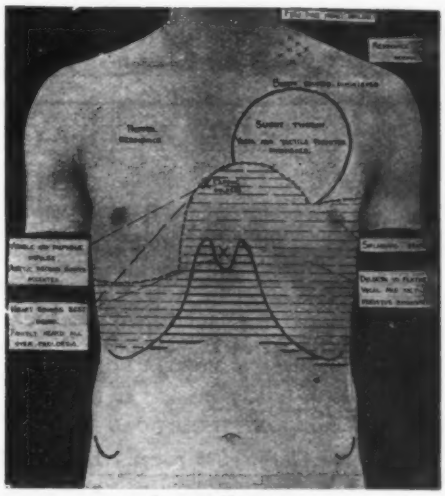

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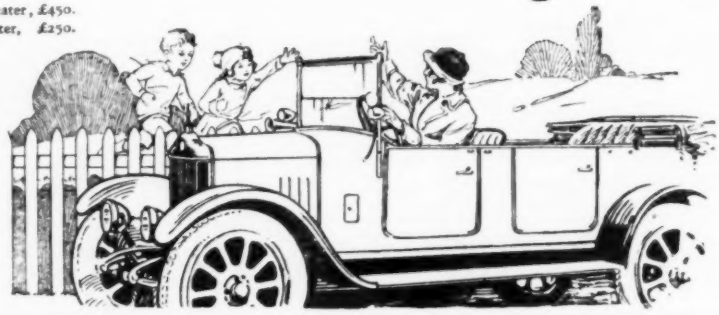

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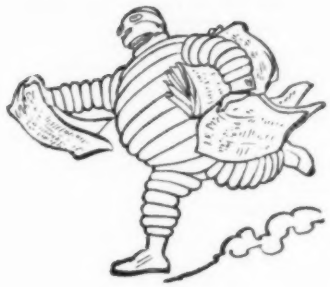

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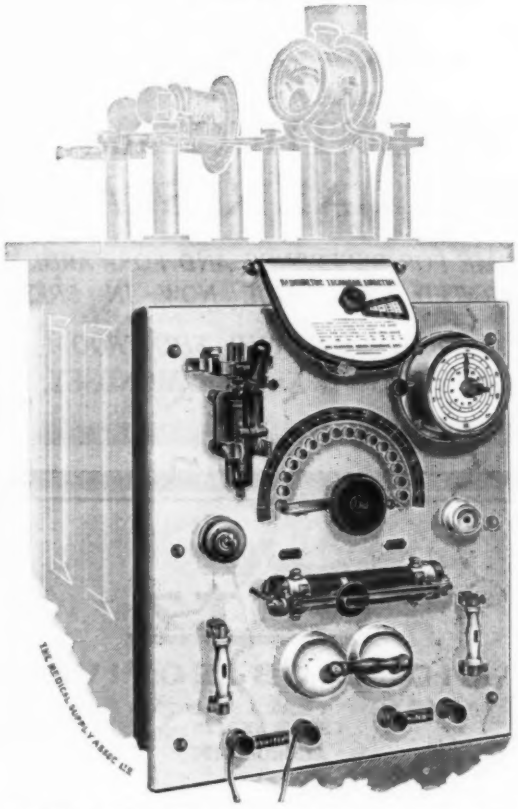

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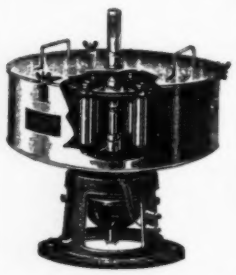

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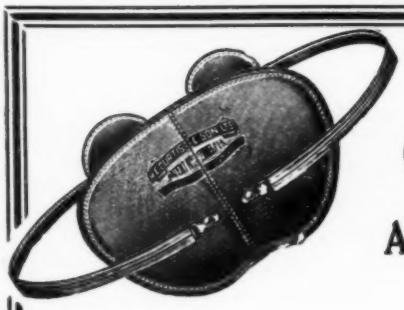

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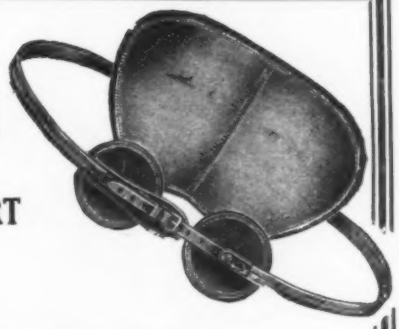

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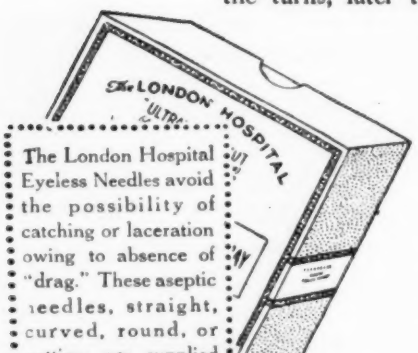

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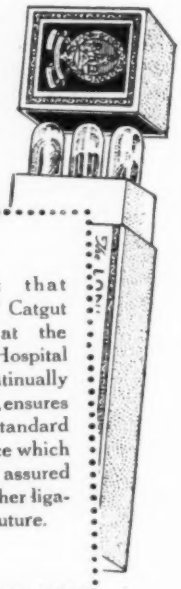

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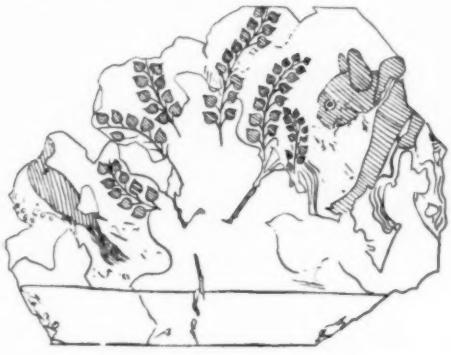

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The Ambulatory Treatment of Fractures and Diseased Joints

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AND ARTICLES BY MANY EMINENT SURGEONS AND PHYSICIANS.

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THE publication of Mr. Hoefftcke's book describing the ambulatory treatment of fractures and diseased joints with his extension appliance and giving cases and results, is a timely reminder of the existence of an apparatus for the application of a principle far too little known or appreciated. Hitherto descriptions of this treatment and testimony as to its value have been confined to papers read before the Medical Societies, articles in Medical Journals and short descriptions in Medical Books. The publication of this amply illustrated work, demonstrating its application to disease and fractures, should be the means of bringing home to the Profession the extent of the mitigation of suffering obtainable by the use of the principle involved in this unique extension appliance. It is invaluable not only for fractures of the long bones of the lower extremities, but also because the whole field of arthritic pathology comes within its scope. A permanent cure may be confidently expected to follow its use, and not merely amelioration of the condition.

The mode of manipulation of tubercular and arthritic joints and their extension on Mr. Hoefftcke's extension table, by means of which the danger of friction between the articulating surfaces during the operation is avoided, is described in detail. Many distinguished medical men have altered their views upon the treatment of fractures and diseased joints, thus :—

Sir Arbuthnot Lane, Bart. (Consulting Surgeon to Guy's Hospital), writing in THE LANCET of May 29th, 1920, says : "Quite a number of years have elapsed since my views on the treatment of tuberculous, rheumatoidal, and other conditions of joints by means of rest were first shaken and then altered by the observation of the results of the combination of movements and extension afforded by Mr. Hoefftcke's appliances. Up to that time I was imbued with the view then accepted, that rest was a factor of vital importance in the treatment of diseased joints. I then learnt that if sufficient extension could be exerted to take pressure off the opposing articular surfaces of the affected joint, movement was most beneficial and often accompanied by little or no pain. . . . The advantages afforded by the forcible separation of the diseased articular surfaces from one another, combined with free movement, are best shown by the use of a really efficient extension apparatus for the leg which does not interfere with the functioning of the diseased joint. This is effected by the apparatus which Mr. Hoefftcke has devised. . . ."

The cases quoted throughout the book, illustrated by X ray photographs taken at intervals, have been sent to Mr. Hoefftcke by medical men, who all bear testimony to the efficacy of the ambulatory treatment.

It is evident that the severity of traumatism, the duration of the disease, and even the age of the individual are factors which may be disregarded when ambulatory extension treatment has been decided upon. Tuberculous joints in children, rheumatoid arthritis with ankylosis in the aged, contractions with suppurating sinuses due to bony injuries, compound fractures, are all amenable to treatment by means of the Hoefftcke extension method, even after years of neglect or when other means have failed to effect a cure.

The principle of the treatment with Hoefftcke's appliance is *Extension with Movement*, transferring the weight of the body to the tuberosity of the ischium and surrounding gluteal muscles, leaving the pubic bone and perineum quite free from pressure. By means of a well-fitting ankle-spat powerful extension up to 25 lbs. can be produced night and day upon the joint surfaces without discomfort to the patient. With the help of this appliance the patient can be allowed to walk about and exercise the joint, so as to avoid slowing the blood supply, and to enable the usual blood current to combat the disease and repair the cartilage and articulating surfaces. Enough has been said to indicate the physiological principles of this treatment and the scientific aim of the extension appliance.

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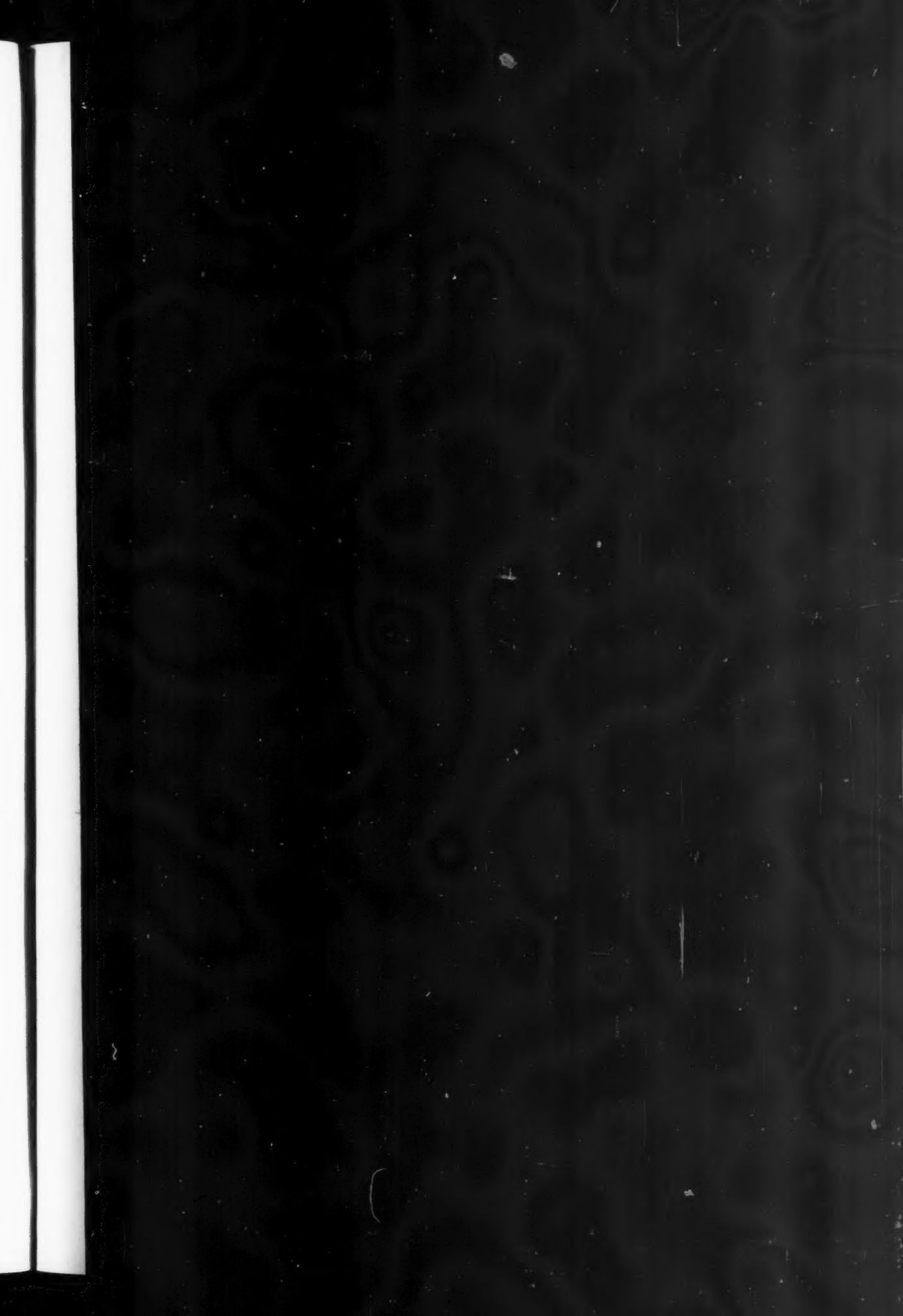

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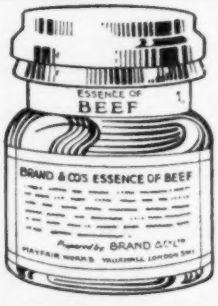

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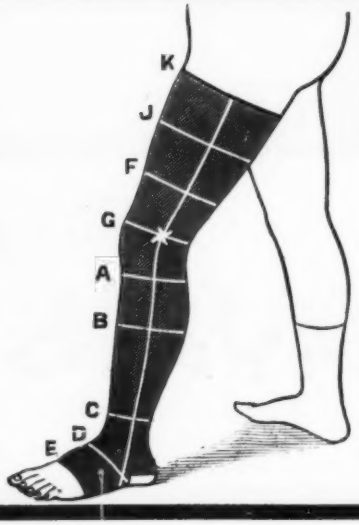

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DISEASES OF CHILDREN.

From July 16th to August 3rd at the Royal Waterloo Hospital for Children and Women. Instruction will be given every afternoon by members of the Staff in all departments.

From September 3rd to September 29th at the Infants Hospital Lectures and Demonstrations will be given by the Director (Dr. Eric Pritchard) and members of the Staff every afternoon from 2 to 6 P.M.

DERMATOLOGY.

From July 16th to July 28th at the Hospital for Diseases of the Skin, Blackfriars. Daily instruction will be given in the Out-patient Department every afternoon with a special Clinical Demonstration each week, and a V.D. Clinic on Tuesday and Friday from 5.30 to 7 P.M.

From September 17th to October 13th at St. John's Hospital for Diseases of the Skin. Special Demonstrations by members of the Staff every morning and afternoon during the whole period.

OPHTHALMOLOGY.

From July 30th to August 25th at the Royal Westminster Ophthalmic Hospital. Clinical Instruction will be given every afternoon with special Demonstrations on Monday, Tuesday, and Wednesday mornings from 10 A.M.

From September 3rd to September 29th at the Central London Ophthalmic Hospital. Classes will be given in the use of the Ophthalmoscope and External Diseases of the Eye in addition to Clinical Demonstrations in the afternoons.

Members of the Staffs of the London Medical Schools will give Lectures and Demonstrations in connection with the various Courses to be held at the Post-Graduate Hospitals, of which particulars will be advertised later.

Other Courses have been arranged as follows:—

	OCTOBER.		
General Medicine and Surgery	Oct. 8–20		London Temperance Hospital and others.
Cardiology	Oct. 15–28		National Hospital for Diseases of the Heart.
Children's Diseases	Oct. 8–27		Victoria Hospital for Children.
Dermatology	Oct. 29–10 Nov.		Hospital for Diseases of the Skin, Blackfriars.
Disease of the Ear, Nose and Throat	Oct. 8–27		Central London Throat, Nose and Ear Hospital.
Genito-Urinary Diseases	Oct. 1–27		St. Peter's Hospital.
Ophthalmology	Oct. 8– 3 Nov.		Royal London Ophthalmic Hospital.
Proctology	Oct. 15–27		St. Mark's Hospital.
Tropical Diseases	Oct. 2–26		London School of Tropical Medicine.
	NOVEMBER.		
General Medicine and Surgery	Nov. 5–17		Royal Northern Hospital and others.
Children's Diseases	Nov. 12– 8 Dec.		"Children's Clinic," Western General Dispensary.
Gynæcology	Nov. 5–30		Chelsea Hospital for Women.
Ophthalmology	Nov. 19–15 Dec.		Royal Westminster Ophthalmic Hospital.
Psychological Medicine	Nov. 5–30		Maudsley Hospital.
Venereal Disease	Nov. 5–30		London Lock Hospital.
	DECEMBER.		
General Medicine and Surgery	Dec. 3–15		Hampstead General Hospital and others.
Dermatology	Dec. 3–22		St. John's Hospital for Diseases of the Skin.
Neurology	Dec. 3–22		Hospital for Epilepsy and Paralysis.

In November and December Lectures on the following subjects will be given by teachers from the Medical Schools:—Diseases of the Ear, Nose and Throat, Gynæcology, Orthopædics, Suggestion Treatment, Vaccine-therapy, Venereal Disease, etc.

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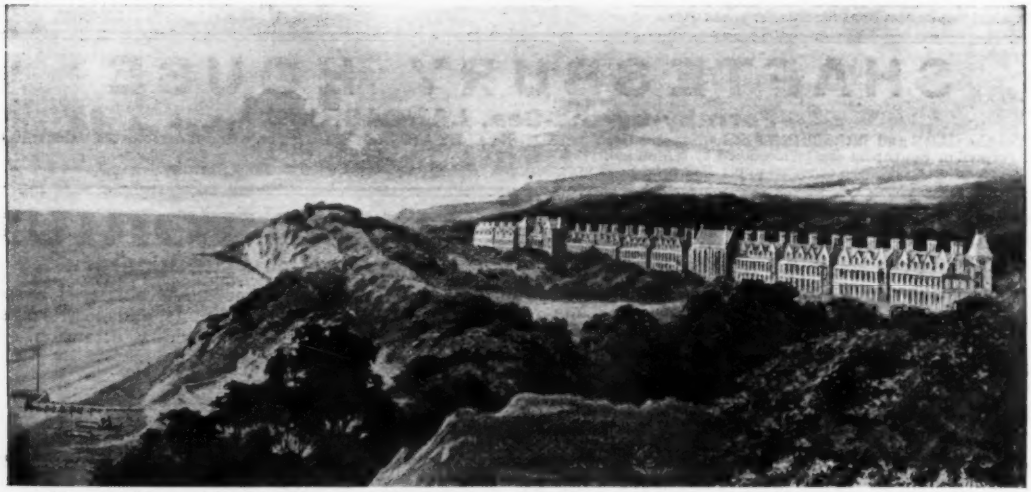

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Inclusive terms 7 guineas a week.

For further particulars apply Secretary.

The Scottish Branch of the British Red Cross Society is prepared to contribute towards payment of the fees of ex-Officers and Nurses recommended by the Society, and such Officers and Nurses obtain priority of admission to TOR-NA-DEE.

SCHATZALP SANATORIUM, DAVOS

FOR DISEASES OF THE LUNGS.

985 feet above DAVOS-PLATZ (SWITZERLAND).

APARTMENTS, WITH BATH.

ALTITUDE, 6120 feet

Managing Physician: Dr. E. NEUMANN.

Prospectus and information from the Management.

DARTMOOR SANATORIUM. 750 FEET.

TUBERCULIN USED ONLY FOR SUITABLE CASES.

WITHIN EASY REACH OF THE MOOR.

X-RAY APPARATUS RECENTLY INSTALLED.

Resident Physicians—C. H. BERRY, M.R.C.S., L.R.C.P.; E. A. CRICHLOW, M.R.C.S., L.R.C.P.

For particulars, apply C. H. BERRY, M.R.C.S., Sanatorium, Chagford, Devonshire. Telephone: 11 Chagford.

VALE OF CLWYD SANATORIUM.

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and of the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the south-west slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views.

Fully-trained Nurses. Nurse on duty all night. X-Ray apparatus newly installed. Every facility for treatment by Artificial Pneumothorax.

Electric lighting in every room. Heating by radiation. For particulars apply to Medical Superintendent, H. MORRISTON DAVIES, M.D. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

DROITWICH BRINE BATHS WARNING.

The Public are warned that the full benefits of the treatment for Rheumatism and kindred complaints **CAN ONLY BE OBTAINED IN THE NATURAL BRINE BATHS AT DROITWICH, FOR WHICH THERE IS NO SUBSTITUTE.** LOVELY HOLIDAY DISTRICT. GOOD HOTELS, &c. Illustrated Booklet Post-free from Baths Manager, J. H. HOLLYER, 48, Spa Enquiry Offices, Droitwich (Worcs.) **SPECIAL FACILITIES TO MEDICAL MEN.**

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

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Small English Pension run on Sanatorium lines.

Apply Mrs. DONNER (late of Villa Gentiana)

Reference by permission to Dr. E. C. MORLAND.

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MONTANA-SUR-SIERRE,

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TUBERCULOSIS CURE STATION

(All the Year). THE FINEST IN EUROPE.

5000 ft. high. Accommodation for 100 patients.

Principal Resident Medical Officer:
BERNARD HUDSON, M.D.Cantab., M.R.C.P.,
Late Physician to the Queen Alexandra Sanatorium, Davos Platz.

FULL PARTICULARS FROM THE SECRETARY, 5, ENDSLEIGH GARDENS, LONDON, N.W. 1.

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On the YORKSHIRE MOORS, near ILKLEY.

IDEAL for NEURASTHENIA, CONVALESCENCE, and RHEUMATIC AFFECTIONS.

THE MOST MODERN ELECTRICAL TREATMENT & MASSAGE.

For Terms apply MANAGER. *Resident Physician* G. COOPER, M.D.

EPILEPSY.

Colthurst House School,

Warford, Alderley Edge.

Under the Management of the Committee of the David Lewis Colony.

Home Life, Medical Care, School Education, most suitable for boys subject to Epilepsy. Terms 42s. weekly.

Further particulars may be obtained from Dr. ALAN MCDOUGALL, The Colony, Warford, Alderley Edge.

EPILEPSY. THE DAVID LEWIS COLONY

Stands in its own grounds of 180 acres and is situated in a beautiful part of Cheshire, 2½ miles from Alderley Edge Station, and 14 miles from Manchester. Electric light throughout. The Colony system ensures the social life and employment most suitable for those who suffer from Epilepsy. Patients certifiable under the Lunacy or Mental Defectives Acts are NOT ELIGIBLE for admission. Two Resident Physicians. Terms for Middle- and Upper-class Patients, from 42s. a week upwards, according to accommodation and requirements. Private rooms can be provided.

For further information apply to the Director, Dr. ALAN MCDOUGALL, Warford, near Alderley Edge, Cheshire.

Telegraphic Address: "Relief, Old Catton." **Telephone:** "290 Norwich.

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—**A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.**

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-st., Norwich, Visiting Physician.

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HARROGATE
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FROM KING'S CROSS
IN 4 HOURS

LEEDS IN 3½ HOURS. RIPON IN 4½ HOURS.

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LEEDS (CENTRAL)	arr.	2.40		RIPON	,,	10.49
HARROGATE	,,	3.15		HARROGATE	,,	11.15
RIPON	,,	3.35		LEEDS (CENTRAL)	,,	11.50
DARLINGTON	,,	4.10				p.m.
NEWCASTLE (CENTRAL)	,,	5. 0		LONDON (KING'S CROSS)	arr.	3.15

COMPOSED ENTIRELY OF NEW PULLMAN CARS

BOOKLET GIVING FULL INFORMATION FROM ANY L.N.E.R. ENQUIRY OFFICE

BOURNEMOUTH HYDRO.

A Residential and Treatment Centre. Telephone 341.

Every variety of Electrical, Massage, and Thermal Treatment: Brine, Turkish, Nauheim, and Radiant Heat Baths.

Resident Physician—**W. Johnson Smyth, M.D.**

INEBRIETY.

[Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars apply to F. S. D. HOGG, M.R.C.S., &c., Resident Medical Superintendent

Saint Luke's Hospital.
Established 1751.

At a BRANCH HOME, in 150 acres, thirty minutes from London, a few LADIES are received as Voluntary Patients, suffering from mild Mental and Nervous illness. Terms from £4 4s. per week.—Apply, Secretary, 19, Nottingham-place, London, W.1. (Tel.: Mayfair 5420.)

Bucks Mental Hospital,
Stone, near Aylesbury.

The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly Charge of 1½ guineas. Apply to the Medical Superintendent.

Grove House, All Stretton, Church
STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

St. Michael's, Broadstairs.—A
charming Country HOUSE, beautiful garden, South aspect, close to sea, where Invalids are received for Rest, Care, or Convalescence. Accommodation for Spinal Cases. Excellent cooking. Moderate charges.—Apply, Miss Gertrude Fletcher, R.R.C.

Doctor can receive Patient or Guest
in charming Residence. Nurse masseuse, &c. Good staff of servants.—Dr. Meyrick, 48, Ennismore-gardens, S.W.7. Telephone: 2130 Kensington.

TO DOCTORS AND SPECIALISTS.

Well-appointed Residential House
at 121, Sloane-street takes slight Invalid Cases (not infectious) with nurses and where relations can stay. Modern comfort; first-class cuisine.—Managing Proprietor, A. V. de Cordes. Tel.: Victoria 9836.

Neurasthenic, Rest Cure, and Chronic
CASES are received from 5 guineas weekly in Doctor's Country Home. Golf, tennis, &c. Own poultry, fruit and vegetables. Tel. 194 Chertsey.

Apply, Dr. Alexander, Harcourts, Chertsey.

ELMSLEIGH, BASSETT, SOUTHAMPTON.

FUNCTIONAL NEUROSES, NERVOUS BREAKDOWN, CERTAIN CASES OF DRUG AND ALCOHOL HABIT, AND CASES NEEDING REST, NURSING, AND DIETING.

Doctor receives a few such in his
comfortable house, ideally situated amidst large gardens and in quiet surroundings. Modern conveniences. Billiards, golf, tennis, and other recreations. Personal attention and modern therapeutic measures.

Medical men invited to apply Secretary for particulars.

Queen Mary's Hospital for the EAST END, E. 15.

Applications are invited for the post of HONORARY MEDICAL OFFICER in charge of the Radio-Electro-Therapeutic Department.

For further particulars apply to the Secretary.

Applications should be at the Hospital on or before 13th July 1923. RAPHAEL JACKSON (Major), Secretary.

East London Hospital for Children

AND DISPENSARY FOR WOMEN, Shadwell, E. 1.—Applications are invited for Part-time PATHOLOGIST to attend daily. Candidates must be duly registered. Salary £400 per annum, with lunch or tea. Appointment will be for one year renewable.

Applications, with not more than three recent testimonials, must reach the undersigned not later than July 14th.

W. M. WILCOX, Secretary.

County of London.

The London County Council invites applications for the appointment of SEVENTH ASSISTANT MEDICAL OFFICER in the LONDON COUNTY MENTAL HOSPITAL SERVICE. Candidates must be not more than thirty-five years of age and must be registered to practise both in Medicine and Surgery in England.

Candidates appointed will be pensionable under the Asylums Officers' Superannuation Act, 1909. Preference will be given to candidates who served, or offered to serve, with H.M. Forces.

Salary £300 a year, rising by annual increments of £25 to £400 a year, without emoluments; also, at present, temporary additions to salary amounting to from £140 to £168 a year. Charges made for board, lodging, &c. (at present £2 9s. weekly).

Full particulars and conditions of appointment on form of application (on which alone application can be made), obtainable from the Chief Officer, Mental Hospitals Department, County Hall, Westminster Bridge, S.E. 1. Canvassing disqualifies.

JAMES BIRD, Clerk of the London County Council.

City of London Hospital for Diseases

OF THE HEART AND LUNGS, Victoria Park, E. 2.

The Committee or Management are desirous of appointing a PHYSICIAN to Out-patients.

Candidates must be Fellows or Members of the Royal College of Physicians of London.

An honorarium is attached to the post.

Applications, accompanied by copies of testimonials, should reach the Secretary at the Hospital not later than Monday, 23rd July, 1923. GEORGE WATTS, Secretary.

Hospital for Consumption and

DISEASES OF THE CHEST, Brompton, S.W.—The Committee of Management invite applications for the post of HOUSE PHYSICIAN (for which there are two vacancies). The duties include work in the Out-patient Department as well as in the wards. Further particulars may be obtained from the undersigned, to whom applications, with testimonials, should be addressed not later than 19th July, 1923. Candidates will be required to attend the meeting of the Medical Committee on Wednesday, July 25th, at 4.30 P.M. The appointment is for six months, with an honorarium of £50.

July, 1923. FREDERICK WOOD, Secretary.

Guy's Hospital Dental School.

Applications are invited for the post of SENIOR DENTAL OFFICER and CLINICAL TUTOR. The duties include general administrative supervision of the Conservation Room and the giving of Practical Demonstrations. The hours of attendance are from 9 A.M. until 12.30 P.M. daily.

Commencing salary £300 per annum, rising by yearly increases of £25 to £400 per annum.

Applications to be lodged not later than Friday, July 13th, 1923, with the Dean, Guy's Hospital Medical School, London Bridge, S.E. 1. from whom further particulars may be obtained.

Seamen's Hospital Society, Green-

wich, S.E.—The Committee invite candidates for the appointment of HOUSE PHYSICIAN at the "DREADNOUGHT" HOSPITAL, Greenwich. Candidates must be Male, doubly qualified and registered. Salary at the rate of £150 per annum and a proportion of fees, with board, residence, and washing. The appointment will be for six months.

Applications, stating age, together with copies of not more than three recent testimonials, to be sent in on or before Monday, the 23rd July, to the undersigned, from whom further particulars can be obtained. By order.

Greenwich, 2nd July, 1923. P. J. MICHELLI, Secretary.

The Miller General Hospital for

SOUTH-EAST LONDON, Greenwich-road, S.E. 10.

HOUSE PHYSICIAN required (three other residents) to commence duty on August 1st. Salary £150 per annum, with board, lodging, and laundry. Applications, stating age, qualifications, and experience, accompanied by copies of not more than three recent testimonials, to be sent to the Secretary.

King's College Hospital.

Applications are invited for the post of SECOND ASSISTANT RADIOLOGIST in the X-ray Department. Candidates must be registered Medical Practitioners, and must produce evidence of special experience in Radiology. Salary £300 per annum for at least half-time.

Applications, with copies of four testimonials, should be sent so as to reach the undersigned, from whom further particulars may be obtained, on or before July 14th.

C. E. A. BEDWELL, House Governor and Secretary.
King's College Hospital, Denmark Hill, S.E. 5.

East Street Welfare Centre,

153A, East-street, Walworth, S.E. 17.

The Committee are desirous of appointing three qualified Medical Practitioners (Male or Female) as HONORARY CLINICAL ASSISTANTS in the CONTRACEPTION DEPT. at the following times:—

Tuesday, Wednesday, Thursday: 2–5 P.M.

A vacancy also occurs for an HONORARY PHYSICIAN for Infants.

The appointments are for six months, and applications, stating qualifications, experience, &c., should be sent to the Honorary Medical Officer-in-Charge on or before July 14th.

The Royal Dental Hospital of London,

Leicester-square, W.C. 2.

The post of HONORARY ASSISTANT DENTAL SURGEON to the above Institution is vacant. Candidates for the same, who must be Licentiates of Dental Surgery of one of the Licensing Bodies recognised by the General Medical Council of the United Kingdom, are requested to send in their applications, accompanied by three testimonials, to the undersigned, from whom further particulars may be obtained, on or before July 11th, 1923. W. J. WADHAM, Secretary.

Royal Naval Medical Service.

SHORT SERVICE SCHEME.

The Admiralty are prepared to accept applications for entry as SURGEON-LIEUTENANTS for Short Service in the Royal Navy.

Period of Service	Three years, with option to extend for further twelve months.
Pay	26s. 6d. per diem, or £483 12s. 6d. per annum.
Gratuity on Discharge ..	£8 6s. 8d. for each completed month of service, or £100 per annum.
Equipment Allowance ..	£50, payable on joining.
Age of Candidates	Not to exceed thirty years.

Surgeon-Lieutenants on the Short Service Scheme will be considered for transfer to the Permanent Service under certain conditions after six months' service.

Regulations for entry and form to be filled by candidates will be supplied on application to the Medical Director-General, 68, Victoria-street, London, S.W. 1.

Willesden Urban District Council.

HEALTH DEPARTMENT.

APPOINTMENTS OF
PERMANENT ASSISTANT MEDICAL OFFICER
AND TEMPORARY ASSISTANT MEDICAL OFFICER.

Wanted Full-time Assistant Medical Officers as above. The temporary appointment is for a period of about six months as from the 25th July, 1923.

The salary of the permanent appointment is £500 to £600 per annum by annual increments of £25, with in addition cost of living Civil Service bonus, making the present total salary and bonus £696 to £801 per annum.

The salary of the temporary appointment is at the rate of £600 per annum without bonus.

Applicants should have had experience in Antenatal and Maternity work, Diseases of Children, Refraction work, and Infectious Diseases.

Applications must be made on the forms provided, which may be obtained from the Medical Officer of Health, Town Hall, Dyne-road, Kilburn, N.W. 6, and must be returned to him duly filled in not later than Wednesday, July 18th, 1923.

E. A. PRATT, Clerk of the Council.
Town Hall, Dyne-road, Kilburn, N.W. 6,
July 3rd, 1923.

The Belgrave Hospital for Children,
Clapham-road, S.W. 9.

The Committee of Management invite applications for the post of HONORARY RADIOLOGIST. The post carries with it an honorarium of 50 guineas per annum for two attendances per week. Applications, with copies of testimonials, should be sent to the undersigned not later than Monday, 16th July, 1923.
THOMAS CLAPHAM, Secretary.

Applications are invited from qualified
Medical Men for the post of MEDICAL SUPERINTENDENT of the EAST LANCASHIRE TUBERCULOSIS COLONY, Barrowmore Hall, Great Barrow, near Chester. Candidates are required to have experience in the institutional treatment of Tuberculosis, and preference will be given to one with experience in the organisation of employment for Tuberculous patients. Salary £500 per annum, with house, light, and fuel.

The Colony is provided by the East Lancashire Joint County Committee of the Order of St. John and the British Red Cross Society, under whose direction the Medical Superintendent will work.

Applications, enclosing copies of three recent testimonials, stating age, experience, qualifications, &c., should be addressed to the Secretary, East Lancashire Joint County Committee, 3, St. James'-square, Manchester, not later than July 18th.

County Mental Hospital, Whitting-
ham, Preston, Lancs.—LOCUM TENENS MEDICAL OFFICER required. Salary £8 8s. per week, together with board, furnished apartments, attendance, and laundry. One who has held House Physician of House Surgeon's appointment preferred.

Candidates must be unmarried and registered under the Medical Act.

Apply, stating age and full particulars, to the Medical Superintendent.

Manchester Royal Infirmary.
ASSISTANT DIRECTOR OF THE CLINICAL LABORATORY.

The Board of Management of the Manchester Royal Infirmary invite applications for the above appointment, which is whole-time, non-resident, and is tenable for twelve months; the holder is eligible for re-election.

Salary £350 per annum. Candidates must be duly qualified and registered; they must state age, and send twelve copies of their application and testimonials to the undersigned by Friday, 20th July, 1923.

The appointment to commence on 1st October, 1923.

By order.
FRANK G. HAZELL, Gen. Supt. and Secretary.
27th June, 1923.

North Devon Infirmary, Barnstaple.
Wanted end of July, duly qualified HOUSE SURGEON. Salary £170 per annum, with board, apartments, and laundry. Appointment to be for not less than six months. Applications, stating age, qualifications, with copies of testimonials, to be sent in on or before Monday, July 16th, addressed Hon. Secretary.

The Sheffield Royal Hospital.—
Applications are invited for the posts of CASUALTY OFFICER; HOUSE SURGEON to the Ear, Nose and Throat Department; and ASSISTANT CASUALTY OFFICER, which fall vacant on August 1st. The posts are each tenable for six months. Candidates must be registered Medical Practitioners and unmarried.

Applications, with copies of testimonials, should be sent not later than July 21st to JOE W. ROBINSON, Secretary.
The Board Room, 2nd July, 1923.

City of Gloucester.
MEDICAL OFFICER OF HEALTH.

Applications are invited from fully qualified and registered Medical Practitioners, holding a Diploma in Public Health or similar qualifications, for the appointments of Whole-time Medical Officer of Health for the City of Gloucester and for the Gloucester Division of the Customs Port of Gloucester at salaries amounting together to £1000 per annum.

There is a Lady Assistant Medical Officer of Health who acts as Assistant School Medical Officer.

Further particulars of duties may be obtained on application to the undersigned.

Applications, stating age, qualifications, and experience, accompanied by copies of not more than three recent testimonials, endorsed "Medical Officer of Health" and addressed to me, must be delivered before noon on Tuesday, the 17th day of July, 1923. Canvassing is prohibited.
GEO. SHEFFIELD BLAKEWAY, Town Clerk.
Guildhall, Gloucester, 3rd July, 1923.

The Queen's University of Belfast.
LECTURER IN PHARMACOLOGY.

Applications are invited for the Lectureship in Pharmacology on or before 7th July.

Salary £450 per annum.

Further information may be had from
J. M. FINNEGAN, Secretary.

County Borough of Stoke-on-Trent.
ASSISTANT MEDICAL OFFICER.

The Town Council invite applications from qualified Medical Men for the position of Assistant Medical Officer with duties chiefly relative to Tuberculosis. Salary £500 per annum, with furnished residence at the Tuberculosis Sanatorium, and heating, lighting, and rates free.

His principal duties will be to act as Resident Medical Officer at the Sanatorium (under the direction of the Tuberculosis Officer) and to assist at the Tuberculosis Dispensary on certain days. He will also be required to carry out any other duties assigned to him by the Medical Officer of Health.

Further particulars may be obtained from the Medical Officer of Health, St. Peter's Chambers, Glebe-street, Stoke-on-Trent.

Applications, stating age, qualifications, and experience, accompanied by copies of not more than three recent testimonials, and endorsed "Assistant Medical Officer," to be delivered to the undersigned on or before Wednesday, 18th July, 1923, at 10 A.M. E. B. SHARPLEY, Town Clerk.
Town Hall, Stoke-on-Trent, 4th July, 1923.

Bristol Mental Hospital.—Assistant
MEDICAL OFFICER and PATHOLOGIST wanted. Candidates must be duly qualified in Medicine and Surgery and unmarried. Salary £400 per annum, increasing by annual increments of £25 to £450, with furnished apartments, board, and washing.

Applications, stating age, &c., with copies only of three testimonials, to be sent to the undersigned marked "Assistant Medical Officer and Pathologist," on or before Saturday, the 21st instant. By order.
EDMUND J. TAYLOR, Clerk to the Visiting Committee.
The Council House, Bristol, 6th July, 1923.

Northampton General Hospital.
(231 Beds.)—Wanted for the end of July, Two HOUSE SURGEONS (unmarried). Salary £200 per annum in each case, with board, residence, washing, and attendance.

Applications, stating age, qualifications, &c., with copies of recent testimonials, should be sent to the undersigned.
7th July, 1923. C. S. RISBEE, Secretary-Superintendent.

Wanted at the Wrexham Infirmary, a
HOUSE SURGEON (Male). The appointment is for six months, eligible for reappointment, duties commencing 1st August, 1923. Salary £150, with board and laundry.

Applications, stating qualifications, and accompanied by recent testimonials, to be sent to the undersigned not later than Monday, July 16th, 1923.
July 2nd, 1923. LESLIE SPENCER, Secretary.

A Resident Medical Officer is required
for the HOVE HOSPITAL (Carr-Burton Memorial), Sackville-road, Hove, to take over the duties on August 3rd. Must be unmarried and under forty years of age. Salary £200 per annum, with board and lodging. Applications, with copies of recent testimonials, should be sent to the Assistant Secretary. Candidates must prove by reference to the current Medical Register or by a production of a certificate of registration that they are legally qualified to practise both Medicine and Surgery. For further particulars, apply to Mr. A. P. LEAK, Assistant Secretary, Brighton, Hove, and Preston Dispensary, 113, Queen's-road, Brighton.

Salford Union Infirmary,
Hope, Pendleton, near Manchester.

THIRD ASSISTANT RESIDENT MEDICAL OFFICER (MALE).
FOURTH ASSISTANT RESIDENT MEDICAL OFFICER (FEMALE).

The Guardians of the Salford Union are prepared to receive applications for the above appointments.

Candidates to be eligible must be unmarried, registered under the Medical Acts, and possess a Medical and Surgical qualification. Preference will be given to candidates with experience of Poor-law or General Infirmaries and possessing experience of X-Ray and Electrical work.

The salary for each appointment is £200 per annum, with furnished apartments, attendance, and rations at the Infirmary.

The appointments, which will be subject to the approval of the Ministry of Health, will be made, in the first instance, for six months. The Guardians expect the persons appointed to remain for this period and to devote their whole time to the duties, and also to act as may be directed by the Medical Superintendent as respects the Union Infirmary and other Institutions of the Union.

The Infirmary contains about 910 beds, is well equipped, and provides excellent all-round clinical experience of all classes of Surgical, Medical, and Children's Diseases, a large proportion of which are of an acute nature.

Applications, stating age, qualifications, and experience, and accompanied by copies of not more than three recent testimonials (which will not be returned), should reach me as early as possible, but not later than 9 A.M. on Tuesday, the 10th July, 1923, endorsed "Third (or Fourth) Assistant Medical Officer."

Canvassing the Guardians will disqualify.

By order.
E. H. INCHLEY, Clerk to the Guardians.
Poor-law Offices, Eccles New-road, Salford,
20th June, 1923.

The Barbados General Hospital.

WANTED.

A duly qualified Medical Practitioner as JUNIOR RESIDENT SURGEON of the Barbados General Hospital. A man who has had experience in administering Anæsthetics preferred.

Salary £250 per annum, to which there is at present added a temporary war bonus of 20 per cent., with furnished quarters.

Applications, accompanied by professional and other testimonials, stating age and date of graduation, will be received by the Steward and Secretary of the General Hospital up to 12 o'clock noon on Wednesday, August 8th, 1923.

Canadian Graduates must be registered in a province, registration in which will entitle them to be registered in the United Kingdom.

Candidates holding a United States Diploma must be registered in the State of New York.

By order of the Deputy Chairman of the Court of Trustees and Directors.
J. WARD, Steward and Secretary.

General Hospital, Jemmott's-lane, Bridgetown, Barbados, B.W.I., May 26th, 1923.

EAST AFRICA.

Vacancies now exist in the grade of

MEDICAL OFFICER, EAST AFRICAN MEDICAL SERVICE, in Uganda and Zanzibar. Salary £600 per annum, rising by £25 annually to £900, with efficiency bars at £700 and £800. Quarters free of rent are provided; also passages to and from East Africa. Private practice is permitted but is in the majority of stations not of much value. Prospects of promotion to the senior grades. Preference will be given to candidates under thirty-five years of age. Full particulars as to pay and pension, and forms of application may be obtained from the Assistant Private Secretary (Appointments), Colonial Office, from whom particulars of vacancies in other Colonial Services may also be obtained.

West African Medical Staff.

Vacancies now exist in the grade of MEDICAL OFFICER in the West African Medical Staff. Salary £660 per annum, rising by £30 annually to £720 during the three years period of probation; then, if confirmed in the appointment, the salary is £720, rising by £40 annually to £920, with seniority allowance of £72 per annum.

Quarters free of rent are provided; also passages to and from West Africa. Private practice is permitted but is in the majority of stations not of much value. Prospects of promotion to the senior grades. Preference will be given to candidates under thirty-five years of age. Full particulars as to pay and pension, and forms of application may be obtained from the Assistant Private Secretary (Appointments), Colonial Office, from whom particulars of vacancies in other Colonial Services may also be obtained.

Medical Officer required, whole-time,

for EMPLOYERS' MUTUAL INSURANCE ASSOCIATION, Scotland.—Apply, giving full particulars, to No. 120, THE LANCET Office, 423, Strand, W.C. 2.

Wanted as Medical Officer for Mining

community in South Africa, healthy, dry climate. Comfortable furnished quarters. Passage paid out and home. Four years' agreement. Must be fully qualified Medical Practitioner and capable all-round Surgeon.—Write, sending full particulars of experience and references, to "H," care of Streets, 30, Cornhill, E.C. 3.

Externe des Hᵘpitaux de Paris,

parlant anglais, prendrait occupation Médicale Londres ou environs pour Août ou Septembre.—Ecrire, Wolfson, 53 bis, Quai des Grands Augustins, Paris VI.

Locum Tenens Provided

at short notice.

Apply to Mr. PERCIVAL TURNER,

the oldest and only Agent who for forty years, *without agency fee to Principals*, has supplied Practitioners with reliable substitutes.

4 & 5, ADAM STREET, ADELPHI, STRAND, W.C. 2.

Telegrams: Epsomian, London. Telephone: Gerrard 399.

After 5 P.M.—Tel. Epsom 695.

Retired Medical Man (M.B. and

D.P.H.), with considerable experience of all kinds of practice, including M.O.H. and School Medical Inspection, &c., desires temporary work.—Address, No. 947, THE LANCET Office, 423, Strand, W.C. 2.

Assistantship wanted by Edinburgh

Graduate (Woman), M.B., Ch.B., General Hospital experience.—Address, No. 124, THE LANCET Office, 423, Strand, W.C. 2.

Locum Tenens Provided

Apply to

Mr. W. S. ATKINS

(Late of Arnold & Sons, London),

43, Bedford-street, Strand, W.C. 2.

Telegraphic Address: "Positions, Westrand, London."

Telephone: Regent 229.

Wanted by M.D., B.S. (Honrs.),

ASSISTANTSHIP with Christian Doctor with view to Partnership or Succession. Experienced Hospital and Private Practice.—Address, No. 122, THE LANCET Office, 423, Strand, W.C. 2.

For Brighton.—Can any Lady

recommend a useful MAID with some Nursing experience, to share work of small flat with cook? Two ladies in family. Highest personal reference essential. High wages.—Reply, 3, Swan-walk, Chelsea.

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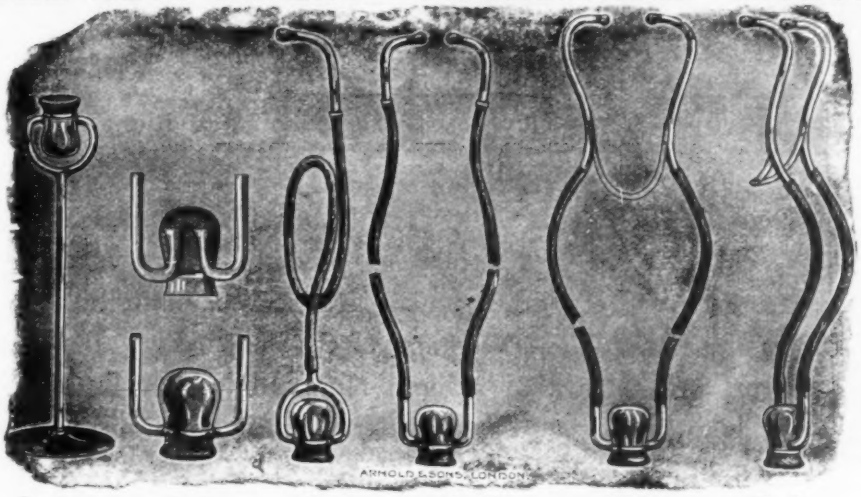

FIG. A. FIG. B. FIG. C. FIG. D. FIG. E. FIG. F.

The New Patent "Phonophore" Stethoscope (Fig. A.) 12/6
Ditto Chest-piece (Fig. B.) 8/6
Ditto Single flexible (Fig. C.) 11/6
Ditto Double flexible (Fig. D.) 15/6
Ditto Binaural (Fig. E.) 17/6
Ditto Folding (Fig. F.) 18/6

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"Accordingly I send you cheque £9 12s. 6d. for eleven, similar to the one I bought.—1st Portuguese Base Hospital." "FRANCE, January 5th, 1919.

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DEAR SIRS,—"I may say I am very pleased with the Phonophore. It renders chest sounds more audible and more distinct than any instrument I have so far used."—Yours faithfully.

DEAR SIRS,—"I have used the Phonophore for twenty years, and have never come across a better stethoscope."—Yours faithfully.

Extract from the "British Medical Journal."—"Some years ago Messrs. Arnold & Sons, of Giltspur-street, E.C., brought out a Stethoscope which they named the 'Phonophore.' Its construction secured a considerably increased volume of sound, and the appliance gained favour among those dissatisfied on general grounds with ordinary stethoscopes, or whose needs, owing to some lack of aural acuity, were not adequately met thereby."

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